STUDY ON THE USE OF FERTILIZERS AND MANURES IN AGRICULTURAL PRODUCTION

सत्यमेव जयते

PROGRAMME EVALUATION ORGANISATION
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PREFACE

At the instance of the Planning Commission and the Ministry of Food and Agriculture, the P.E.O. undertook an evaluation study on the use of Fertilisers and Manures in Agricultural Production. Broadly speaking, the problems relating to planning, programming, distribution and extension, credit, supply, rate of increase in the consumption of fertilisers and manures, the technical recommendations for their use, the factors responsible for the prevailing level of use, the role of the extension agency and the attitudes and responses of the cultivators to this programme, have been studied and examined in some detail at various levels. However, the production aspect was outside the purview of the study.

The present report spotlights the administrative hurdles and organisational limitations connected with the implementation of the programme, the inadequacy of the soil testing apparatus, the unrealistic approach to fixing up of targets for distribution and allocation of fertilisers, lack of a comprehensive and coordinated working programme for supply arrangements and credit facilities, the limited involvement of local institutions, lack of any definite farm planning and inadequate supervision and follow-up of the demonstration programme by the extension agency. The report also suggests certain remedial measures for streamlining, the extension of fertiliser use and augmenting the local manurial production in the overall schemes of agricultural production.

In the conduct of the study, a number of official as well as non-official agencies such as the Central Ministry of Agriculture, Departments of Agriculture in the States, officials responsible for planning and implementation of the fertiliser programmes at the district and block levels as well as local institutions such as cooperatives, panchayats etc., extended their cooperation and assistance. Such cooperation and assistance received from all agencies, including the large number of cultivators who responded to our enquiry, are gratefully acknowledged.

Chief
Programme Evaluation Organisation
Planning Commission

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PROGRAMME EVALUATION ORGANISATION

(Planning Commission)

Study on the Use of Fertilisers and Manures in Agricultural Production

CHAPTER I

OBJECTIVES, SCOPE, DESIGN AND METHODOLOGY OF THE STUDY

Introduction

1.1 Use of chemical fertilisers to boost up the crop yields has been accorded the topmost priority in the new strategy for agricultural production programmes during the Fourth Plan period. It is not that the importance of chemical fertilisers in the scheme of agricultural operations has suddenly been realised now. Over the entire period of fifteen years of planning, the importance of application of chemical fertilisers for the principal food and commercial crops has been fully recognised; not only that, concrete steps have been taken to augment the production and import of chemical fertilisers on the one hand and measures to distribute them throughout the country together with suitable facilities of credit, extension etc., on the other. It is true, however, that use of chemical fertilisers in the country is relatively of a recent origin, the intensive efforts almost synchronising with the planning era. The following table indicates the growth of fertiliser use in the country over the three Plan periods :

Targets fixed and level of consumption reached over the Plan period in terms of N.P. and K.

('000 tons)

Period	Targets			Achievements		
	N	P	K	N	P	K
1	2	3	4	5	6	7
Pre-Plan (1950-51) .	9·2	18·7	N.A.	55·0	7·0	N.A.
End of First Plan (1955-56) . .	76·0	40·8	N.A.	105·0	13·0	N.A.
End of Second Plan (1960-61) . .	290·0	244·8	N.A.	230·0	70·0	26·0
End of Third Plan* (1965-66) . .	800·0	250·0	150·0	600·0	150·0	90·0
Anticipated by the end of Fourth Plan (1970-71) . .	2,000·0	1,000·0	750·0	—	—	—

*These are the reduced targets, revised after the mid-term appraisal of the Third Five Year Plan while achievement figures are figures of likely consumption in 1965-66 as assumed by the Committee on Fertilisers.

1.2 The actual consumption of fertilisers, both nitrogenous and phosphatic, has been less in the Second and Third Plans as compared with the target fixed. Achievement in the First Plan, in the case of N only is higher by one and a half times than the targets fixed for that year. If, on the other hand, levels of consumption of N, P and K as prevailing at the end of each Plan, are compared, rise in consumption appears to be satisfactory, especially when the comparison is attempted with the pre-Plan period. Consumption of nitrogenous fertilisers by the end of First Plan compared to what it was on the eve of the First Plan doubled, while that of P also doubled during this period. Whereas N again doubled itself by the end of the Second Plan, consumption of P went up six times over this very period. Achievement in regard to N and P types of fertilisers at the end of Third Plan is likely to be more than double compared to the performance at the end of the Second Plan. Consumption of potassic fertilisers is however, not so very marked over this entire period. In most parts of the country soils are deficient more in Nitrogen and phosphoric acid than in K_2O. The targets fixed for the Fourth Plan period indicate the crucial role assigned to this agricultural input.

1.3 The average Indian farmer is more receptive to new ideas, methods and materials today than fifteen years ago, thanks to the network of the National Extension Service created under the C.D. Programme in a record period of just a decade. This extension agency had its strong as well as weak points. But in the context of extending the use of chemical fertilisers over vast areas and through large masses of small and big cultivators, this agency has been playing the key role. There are a number of directions in which improvements can be thought of so as to strengthen the extension machinery at different levels. These are discussed in the appropriate section of this Report. Here it may be pointed out that comprehensive studies throwing light on the various implications of the fertiliser programme —arrangements for production, allocation to the various States, fixation of realistic targets, timely distribution to the cultivators during different crop seasons, educating the cultivator on the correct dosage and method of application, extending timely credit facilities, incentives and inducements attitude and response of cultivators to this programme—are not many. It is only recently that the N.C.A.E.R. brought out a limited study on the Problems of Fertiliser Consumption. The Committee set up by the Ministry of Food and Agriculture to review the fertiliser programme has brought out quite a comprehensive analysis of the policy implications and has made a number of far-reaching recommendations to the Government of India on this programme. However, the available reports do not bring out adequately the numerous problems faced in extending the use of fertilisers and manures, particularly at the district, block, village and cultivator levels. It is in this background that this report of the P.E.O. (based on a comprehensive field study completed by the P.E.O. during 1962-63 covering 38 districts, 75 development blocks, 375 sample villages and 4,373 cultivators and tenants) should be viewed. The following were the main objectives of this study:

Objectives

1.4 There has been a tremendous growth in the use of chemical fertilisers over the Plan periods as already seen. Because of the insufficiency of domestic production, considerable foreign exchange is being spent to import fertilisers. Large scale expansion of the internal production of various types of fertilisers is also contemplated. All such measures implemented during the previous Plans as well as those proposed for the Fourth Plan have thrown up quite a number of problems in regard to distribution, extension etc. The use of chemical fertlisers in large doses without the use of crop varieties withstanding heavy doses of fertilisers, without the required cultural practices etc., and without adequate knowledge of appropriat techniques of application would not yield expected results.

1.5 This is only one aspect of the problem. The other equally important aspect is the use of organic manures such as compost, green manure etc. Considerable stress is laid in augmenting the production of such local manurial resources also. From 83 million tons of reported production of rural compost in 1960-61, the target for the Third Plan was fixed at 150 million tons. An area of 41 million acres was targetted to be covered under green manuring during the Third Plan period. These were some of the issues at the time of formulating this study. In the light of these, our objectives in studying the use of fertilisers and local manurial resources for agricultural production were (i) to analyse the growth of fertiliser and manure inputs of specific crops; (ii) to study problems involved for stepping up the distribution and consumption of different types of fertilisers and local manurial resources; and (iii) to understand the attitudes and responses of cultivators for this programme. While the problem of production of chemical fertilisers was outside the purview of this study, those relating to production of local manurial resources were gone into in as much detail as possible.

Scope of the study

1.6 Broadly, the following problems have been studied and examined in detail at various levels : (i) the rate of increase in the consumption of organic and inorganic manures; (ii) technical recommendations about the use of chemical fertilisers, application of these in different soil types, crops raised under irrigated and unirrigated conditions; (iii) factors responsible for extensive and meagre use of fertilisers and local manurial resources for agricultural production; (iv) role of extension agency in promotion of rational use of both chemical fertilisers and local manurial resources in terms of their availability and optimum use for increased production; (v) methods of organising demonstrations, effectiveness of these and follow-up action; (vi) attitudes and responses of the cultivators to the programme; and (vii) assessment of the resources for the preparation of organic manure and green manure and problem faced, if any, in their use.

Design of the study

1.7 The study was conducted in 15 States and in Himachal Pradesh. In each State, two to three districts were selected, one of which was an intensive agricultural programme district (package). The I.A.D.P. districts are, generally speaking, favourably situated in respect of irrigation facilities, yield of important crops and the use of fertilisers. A concentrated effort is made in these districts to step up agricultural production and all agricultural programmes, particularly fertilisers, have been taken up on an intensive scale. The additional district or districts in each State was/were selected from the remaining districts in the States or from the districts in each broadly known region of the State. In selecting such non-I.A.D.P. districts, three criteria had been adopted; (i) the extent of irrigation; (ii) average yield of principal irrigated crop or of paddy, if it is the important crop, and (iii) distribution of fertilisers per 1,000 acres of irrigated area or per thousand acres of paddy area. In the first place, the districts which were lower than average in respect of proportion of irrigated area to net sown area in the State or each region in the State, were eliminated from the frame of selection.

From the remaining districts, in each region or State, the one at or near the bottom in respect of yield of principal crop and also the average distribution of fertilisers per 1,000 acres of irrigated area, were selected for this study. Thus, in each State, two districts were selected, one was the package and other where the irrigation facilities were more than the average in the State; but the yield of the principal crop was lower as also the distribution of fertilisers. Going by the criterion of irrigation, this is probably the district where there is considerable potential for extending the fertiliser use and for also enhancing per acre yield of the crop.

1.8 In each district, two blocks were selected for further investigation. The procedure for the selection of blocks was the same as that for the district with the exception that the Blocks started after 1st April, 1960, were not considered for selection. Thus the Blocks with lower than the average irrigated area in the district as well as blocks started after 1st April, 1960 were excluded from the frame of selection of Blocks. From the remaining Blocks, two were selected—one with the highest consumption of fertilisers per thousand acres of irrigated area and the other with the lowest consumption of fertilisers. In working out the consumption of fertilisers in the Blocks, only the irrigated area was taken into account and the areas under different crops were reduced to a common denominator on the recommended doses of fertilisers for different crops. For instance, if sugarcane crop is recommended four times the fertiliser dose compared to the wheat crop, one acre of the sugarcane was reckoned as four acres of wheat for such calculations. The doses of fertilisers recommended for various crops at the Block level only were taken into account in the selection of Blocks. The purposive selection of districts and Blocks, as explained above, had been followed mainly with a view to throw up the numerous problems of fertiliser use in such areas where the field situation was already favourable or the potential for future use was considerably high. In the district or the Block where the fertiliser consumption was already high, we expected to get the conditions and the practices which helped this adoption. We also would, know from these areas whether further extensive use of fertilisers was possible on the basis of recommended doses. In the other districts and Blocks where the fertiliser consumption was low, we would know the conditions or factors responsible for this low consumption even though the basic facility of irrigation etc. might be better in these compared to the number of other districts in the States. The lessons from the first group of districts (I.A.D.P.) may also serve as guide-lines for stepping up the fertiliser consumption in the latter group of districts by analysing the trends prevailing in both these districts. The names of the Districts and Blocks selected for the study are given in Table No. 1.1 (Appendix).

1.9 In each of the selected Blocks, five villages were selected for detailed investigations. One of these was the headquarter village of the V.L.W. The criteria adopted for selection of villages were as follows : In the Blocks of the package programme districts, the villages not included in or selected for coverage of the programme and those that were classified as urban places, as per Census, 1961 (or 1951 census) were excluded from the list of villages included in the frame. In the old package districts in the sample (West Godavari, Shahbad, Ludhiana, Aligarh, Pali, Raipur and Tanjore) villages covered by the programme in 1962-63, were excluded as the village covered earlier were considered of an adequate size for purposes of our sampling. In some of the new package programme districts where the programme had not been in full swing, the villages proposed to be covered by the programme formed the frame as they had some advantages in respect of extension of package programme.

1.10 In the non-package districts, all the villages in the selected Blocks were listed out and from the list those villages which were uninhabited, villages with less than 300 population, villages with proportion of irrigated area to net sown area lower than that of the district as a whole and villages which were urban places as defined in 1961—census (or 1951 census) were eliminated. In certain cases, the criterion relating to irrigation was substituted by the principle of proportion of paddy area to the gross cropped area. The remaining villages in each Block were grouped into two categories, *viz.*, (a) the V.L.W. headquarter villages and (b) others, and were arranged in the descending order of the proportion of irrigated area to net sown area.

1.11 Only those villages which had been the present headquarters of a V.L.W. for at least one year were considered for inclusion in the list of V.L.W. headquarter villages. From the list so prepared the village with the highest proportion of irrigated area to net sown area was selected for this study. In the case of other villages, the frame was divided into three equal strata and four villages were selected, one from the stratum 1 (the V.L.W. headquarter village was also to be from this section) one from stratum 2 and two from stratum 3. Thus 375 villages were selected for detailed investigation on the above criteria.

1.12 A list of all cultivating households in the selected villages was prepared in a proforma designed for the same. From this list, all those households having an area of one-half acre or below of cultivated holdings were excluded. The remaining households were then arranged in the descending order of their operational holdings. The lists so re-arranged were divided into five sections and two cultivators from each section were selected at random. Thus, 10 households were selected per village on the above method for canvassing of households schedule/questionnaire for individual respondents. Later, when canvassing progressed somewhat, the Investigators were in a position to get an idea from the villagers about the number of share croppers in the village. A list of mainly or wholly share croppers was then prepared and arranged in the descending order of their total operational holdings. This list was divided into 2 sub-groups and two tenants were randomly selected from each sub-group. Thus, for this study, 14 respondents per village were selected for canvassing the household schedules. The total number of households thus canvassed was 3,749, of whom 3,084 were owner cultivators, 320 tenant cultivators and 345 others who had also some cultivation holdings. 624 additional tenants/share croppers (in certain number of selected villages this category was less than four or even nil) were also interviewed for the household schedules.

Methodology of field investigation

1.13 The study as already indicated was conducted, commencing from the State down to the cultivator-household level. At the levels of State and district relevant information for the study was collected from the Departments of Agriculture, Cooperation, Central Cooperative Banks State and District Marketing and supply-cooperative organisations, etc., through schedules and guide-points. The Regional Evaluation Officers and the Project Evaluation Officers met the concerned agencies several times in the course of the field investigations and collected such data through discussions, official records etc. Similar method was adopted for obtaining relevant data at the Block and village levels. At the households level a comprehensive schedule was canvassed to each cultivator respondent by interview method. Qualified and experienced field Economic Investigators under the over-all supervision of the P.E.O. and R.E.O. carried out this crucial part of the investigation. Besides field officers located in the States, the Project Director and other senior officers of the Headquarters visited the various selected districts, blocks and villages and supervised the collection of reliable data during the different phases of the enquiry.

General background of selected districts

1.14 As described earlier in each of the fifteen States, one package district and one or more non-package districts were selected purposively for the Study. (In Jammu and Kashmir and Himachal Pradesh only one district could be studied). The criteria of selection of these districts, blocks etc. have been discussed in the earlier paragraphs. For a proper appreciation of a study of this nature, it would be necessary to have a general idea of the land utilisation and cropping pattern of these districts.

Land Utilisation

1.15 The pattern of land utilisation in our selected districts is presented in Table No. 1.2 (Appendix). From the angle of fertiliser use, two or three important features of this table may be mentioned here. Districts with larger proportion of irrigated area, as well as, areas of assured rainfall offer better scope for use of chemical fertilisers in comparison with districts where these facilities are relatively low. In almost all the package districts the proportion of gross irrigated area to geographical area is quite high, notably in the districts of West Godavari, Shahabad, Thanjavur, Mandya, Ludhiana, Aligarh and Burdwan. In some of the other package districts irrigation is not such an important factor but assured rainfall seems to be the most favourable factor (Cachar, Raipur, Bhandara, Surat and Alleppy). Among the non-package districts also quite a few of our selected districts show larger proportions of gross irrigated areas, *viz.*, Bhatnagar, S. Canara, Muzaffarnagar, Ganganagar and Azamgarh. These districts also offer greater potentialities for higher consumption of chemical fertilisers. Even the other non-package districts selected for the Study relatively enjoy better irrigation facilities compared to the other districts in each State.

1.16 Intensity of cultivation is another indicator of the potentialities for high fertiliser use. This is high in almost all the package districts. Even among non-package districts intensity of cultivation is quite high in seven of them. In about 2/3 of selected districts more than 50% of the geographical area constitutes the 'net sown area' and this is another significant feature relevant in the context of fertiliser use. Except in a few districts of Madhya Pradesh, Assam, Rajasthan and Mysore the proportion of uncultivated area (excluding fallow lands) is generally small in these selected districts of our Study.

Cropping Pattern

1.17 Data on the cropping pattern in these selected districts are presented in Table No. 1.3 (Appendix). Inter-comparison of package districts reveals that production of foodgrains including various types of millets forms an integral part of the agricultural economy of these districts. More than half of the gross cropped area in the year 1961-62 was under food crops in the selected districts of 11 States. In the package districts of 4 other States, proportion of food crops to gross cropped area was less than 50%. These districts, however, had relatively larger areas under commercial crops like sugarcane, cotton, groundnut etc.

1.18 Comparison as between package and non-package districts also reveals more or less the same pattern as above. In half of the number of States, our selected package districts had more area under foodgrains (including millets) compared to non-package districts. In the remaining States, except Bihar, Assam and Maharashtra, area under foodgrains in 1961-62 was less than half of the gross cropped area in the package districts. The principal food and commercial crops shown in the Appendix Table No. 1.3 do not happen to have good coverage in some of our selected package and non-package districts. Plantation crops have their importance in the States of Kerala and Assam. Pulses and oil seeds are important crops in the districts of Bihar, Gujarat, Madhya Pradesh, Maharashtra, Mysore and West Bengal. The cropped area under vegetables was less than one per cent in most of the selected districts.

1.19 The proportion of green manure crops was somewhat disheartening in most of these areas. But it has to be remembered that official records do not always take into account the extent under green-manures. For instance, in districts such as West Godavari and Thanjavur a sizeable area under paddy crop is sown with green manure crop at least during one crop season. But the village records do not account them separately. Probably, this is the situation in quite a few other districts. In certain districts, green-manure crops are not raised on the fields but green leaves etc. procured from forest areas are applied to paddy crop as in Chittor district of Andhra Pradesh.

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CHAPTER II

SOIL TESTS AND RESEARCH

2.1 A systematic programme of soil testing is indispensable for placing soil management practices on modern scientific lines. Considerable research work on soil testing and analysis is being carried out in this country over the last several decades. However, the initial efforts were mainly in the direction of classifying the soils into broad soil types for making recommendations about general management and manurial practices. A large proportion of this work was confined to the State research farms only.

2.2 A more systematic soil research began in the country with the steady expansion and strengthening of the research wings of the States' agricultural directorates. The I.C.A.R. and I.A.R.I. have been playing a significant role in making available to the States necessary technical guidance, financial assistance and encouragement. As a result of these efforts, valuable data are collected and analysed for the protection, development and economic utilisation of agricultural lands on modern scientific lines. The importance of soil testing lies in helping these efforts to achieve higher levels of efficiency in soil management practices. The discussion in this Chapter is confined to an analysis of the complementarity of this programme to the use of fertilisers and manures on agricultural lands.

Programme of soil testing in India

2.3 The programme of soil testing has been of recent origin in India. "Rapid soil tests for nitrogen, phosphate, potassium, Ph. organic carbon and conductivity are being conducted at the Indian Agricultural Research Institute (IARI) New Delhi"[1] and in the soil testing laboratories located in the different States. "The soil testing laboratories analyse free of cost soil samples received directly from the farmers or through the agricultural extension workers."[2] Table No. 2.1 (Appendix) gives the location and other details of the soil testing laboratories established during the pre-Plan and the first two Plan periods and the targets for the Third Plan period.

2.4 The programme of establishing soil testing laboratories in each State was taken up seriously only during the Second Plan period. However, in the three States of Bihar, Uttar Pradesh and Himachal Pradesh soil testing facilities existed prior to this period. In Uttar Pradesh, the earliest effort on soil chemistry dates back to as early as 1906, but the attempts were mainly in the nature of routine examination of the soils. Soil testing work as such was taken up in this State only in the late thirties and since then developed on a systematic basis culminating in the establishment of five regional laboratories for soil survey, so located as to cover all the important soil divisions of the State. Besides soil surveys, preparing soil maps, these centres also make fertiliser and soil management recommendations for different soil types. Apart from these five Regional Laboratories, one Sugarcane Research Station with two sub-stations and two Research Stations for fruit crops were also started in Uttar Pradesh state during the pre-Plan period.

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[1] Soils, their Chemistry and Fertility in Tropical Asia by R. V. Tamhane, D. P. Motivamani, Y. P. Bali in collaboration with Ray L. Donahue—P. 359.

[2] Ibid.

In Bihar also, soil surveys for classifying soils according to nutrient deficiencies and Ph. data began from the early twenties. However, the systematic Reconnaisance Soil Survey of the State began in the year 1954 and was expected to be completed by the end of the Third Plan.

2.5 The Second Plan period had witnessed the establishment of 29 soil testing laboratories in the different States except Himachal Pradesh. Most of these laboratories were set up in collaboration with the Technical Co-operation Mission of the U.S.A. By the end of the Second Plan period each of the 15 States had, at least, one soil testing laboratory set up. Of the 29 laboratories (both under T.C.M. and State-sponsored) set up during this period, the largest number namely 6 was in Uttar Pradesh, followed by 3 in Andhra Pradesh, 2 each in Madras, Maharashtra, Mysore, Orissa, Bihar, Madhya Pradesh, Punjab and Rajasthan and one each in Kerala, Gujarat, Assam and West Bengal. Of the three laboratories set up in Andhra Pradesh, the one located at Rajahmundry caters to the needs of Tobacco growing areas only. Similarly, of the two laboratories set up in Mysore, the Barehonnur laboratory was set up by the Coffee Board to meet the needs of Coffee plantations in the State. In the Third Plan, all the States except Maharashtra and Mysore had fixed targets for the establishment of soil testing laboratories. 47 soil testing centres had been targetted to be established in 13 States against which 12 had been established by 1962-63.

2.6 Bihar and U.P. States have programmed to set up a large number of soil testing centres. In Bihar, under the Third Plan programme of setting up 17 soil testing centres, it is proposed to have one soil testing unit in each of the remaining 13 districts. Of these, three laboratories have already been set up in Sahasra and Champaran districts of North Bihar and in Shahabad Package district in S. Bihar. Pending the construction of buildings etc. the Shahabad unit is now functioning with the Patna Regional Research Institute. Thus it is only in Bihar that each of the State's 17 districts would be having a soil testing centre if the Third Plan targets were to be achieved. In Uttar Pradesh also, the Third Plan programme for the setting up of soil testing facilities was taken up on an equally ambitious scale as in Bihar. Two of the 14 soil testing centres programmed for the Third Plan have already started at Kanpur and Aligarh. There was also a programme to strengthen the section of the Agricultural Economist and to create another section of Production Econnomist at Kanpur. Besides, the State Government proposed to extend the soil testing facility to the farmers through the services of 23 educational institutions.

Problems of a general nature in the Programme of soil testing and research

2.7 (1) It is reported that systematic and continuous information on the follow-up data on yields etc. was not being made available to the laboratories. Systematic follow-up of soil tests at the field level in respect of application of fertiliser on yield, etc. proved problematic on account of the difficulties in maintaining proper records at the farmer's level (A.P., Madras M.P. and U.P.)

(2) The present programme of soil testing at the field level largely caters to the needs of individual cultivators and that too to the more progressive ones. (A.P., Madras, Mysore and H.P.).

(3) The number of soil testing laboratories in the States was inadequate compared to the needs based on numerous soil types and the mass of

cultivators to be covered under the programme. Some State Governments were of the view that there should be one laboratory at least for a group of two to three districts. Although both in the Second and Third Plan periods considerable stress was laid on increasing the number of soil testing laboratories in the country, yet adequate number of these were not set up because of foreign exchange difficulty. However, in the Fourth Draft Plan, the importance of this programme has been emphasised as follows:

> "A significant aspect of developing scientific agriculture is proper soil and water management.....It is also proposed that the soil testing facilities may be built up and put into operation for carrying soil analysis for each area of intensive cultivation. The knowledge thus gained would be used for judicious land use planning and crop planning to the best advantage of the country and the farmers." (Para 72, Chapter XI of the Draft Fourth Plan).

(4) Even though efforts were made in a number of States to set up soil testing laboratories towards the middle or closing part of the Second Plan, some of these could not effectively function for want of suitable equipment, material and trained technical personnel (Assam and Orissa).

(5) The installed capacity of the laboratories that were set up during this period could not be fully used because of inadequate erratic and incomplete identification particulars accompanying the flow of samples reaching the laboratories from the field (West Bengal and Bihar).

(6) In Punjab a district level extension specialist was vested with the responsibility of sending soil samples to the laboratory. In Rajasthan, the Panchayat Samities are required to collect the samples from cultivators and send them to the laboratory. But in this arrangement, the D.A.O. did not come into the picture.

(7) In Gujarat, much importance was not attached to soil tests. These were considered to be redundant and uneconomical although such tests might be of limited applicability in inferior soils such as alkaline, saline etc.

2.8 To remedy such deficiencies as above in the soil research programme of different States, action needs to be taken to:

(a) expand the existing facilities with suitable equipment and personnel;

(b) arrange for the regular and even flow of samples to the laboratories through the institutions like panchayat samitis, etc.;

(c) evolve and maintain suitable records from the village level upwards so as to facilitate proper analysis of data on these tests; and

(d) fix suitable fertiliser recommendations for different soils and crops.

2.9 Attempts were made to build a picture of the status of the soils in our selected districts, proportion of the cultivated area affected by the deficiency of one or the other type of nutrient and whether any systematic efforts were made to co-relate soil surveys and soil test data with the recommendations made in the district regarding the application of fertilisers to various crops. Firstly, quantitative data obtained through the district authorities of the Agriculture Department were very meagre to be of any use in this analysis. For instance, in a large number of our selected districts (with the exception of package districts), the District Agricultural Officer was not in the picture either at the time of sending soil samples to the soil testing laboratory, nor was he kept informed of the results of the numerous tests carried out by the laboratories. Secondly, even this meagre data furnished to us were not based on scientific surveys, experiments, etc. Thus the recommendations on fertilisers for different crops were of a general type applicable for an entire soil tract covering at times a whole region of the State.

Preparation of manurial schedules

2.10 The State Departments of Agriculture were requested to furnish information on (a) the basis for the existing manurial schedules prepared for the major crops grown and (b) the prediction value on account of use of fertilisers in certain recommended dosages. Only few States furnished information on these aspects. It appears (as borne out from the Statewise illustrations narrated below) that there is no uniform basis adopted for preparation of manurial schedules for different crops. For instance, in Andhra Pradesh, the Agricultural Chemist prepares these manurial schedules, keeping in view the different soil types and the soil tests that are conducted for nutrient deficiencies, Ph. value, local practices, etc. But the low prediction value, as at present, is attributed to lack of adequate data to the soil test laboratories on the adoption of soil test recommendations. In Kerala, the manurial schedules are prepared on the basis of doses derived from the field experiments conducted for different crops. There is also an Expert Committee which in its annual meetings reviews the available data on fertiliser trials and fixes the tentative doses of chemical fertilisers for various crops. Due to lack of adequate information on the follow-up—soil test—crop responses no firm basis is there to arrive at the prediction value. In Madras State, however, the soil test—crop response studies conducted by the I.A.R.I. are the basis for fixing the manurial schedules. After the advent of package programme and the resultant expansion in soil testing facilities, it is now proposed to fix doses of fertilisers for each village and then to every 25 acre holding. In Gujarat, it is the crop response to a particular dosage and not soil test results which is considered to be more practical. Field trials and demonstrations conducted both at the research stations and at cultivators' farms, are the basis for evolving suitable manurial schedules in the State. Prediction value is considered to be very high in this State because of this practical approach. In Assam on the basis of certain limited soil tests, the soils in the State have been classified into four broad categories. For each category, separate doses for different crops are arrived at.

Steps taken to propagate the results of soil tests

2.11 The field position in this regard was somewhat disappointing in many of these districts. In as many as 16 districts, the maximum effort reported in this direction was to communicate results of soil analysis to the cultivators concerned from whose lands samples were taken. Except in the case of five districts—*viz.*, Alleppy, Trichur, Aligarh, Jhansi and Raipur, the Block officials concerned were not informed of the details of soil analysis carried out for individual cultivators. The line of communication was otherwise direct between the ryots concerned and the soil testing agency. In the five districts mentioned above, the District Agricultural Officers/Block officials concerned were intimated of the results of tests by means of a copy of the analysis report. The district authorities generally pleaded ignorance about the progress of the entire programme. Propagation of soil test results implied a systematic follow-up after communication of the results to the cultivators concerned. The position was somewhat different, though no better, in respect of the four districts of Karimnagar, Burdwan, Ganga Nagar and Chittorgarh, where the programme of soil testing was of little significance owing to very few number of soil tests that were conducted.

2.12 Only in a handful of districts (Thanjavur, Pali, Hissar, Mandya, Raipur and Muzzaffarpur), some positive measures were reported to have been taken for propagating the results of soil tests among the cultivators. In Thanjavur, a card denoting all the recommendations on fertilisers and their doses based on soil analysis had been devised and the response of the farmers to this approach appeared to be encouraging. The officials also maintained proper records which helped proper follow-up of the programme. In Pali district of Rajasthan, the Agricultural Extension Officers and the V.L.Ws. reportedly held discussions at Panchayat meetings on soil test results while in Hissar district 'soil testing week' was observed in villages wherein the efficacy of the programme of soil testing was explained by extension workers. In Mandya district of Mysore State, it was programmed for the year 1963-64 to include a sub-plot in the composite demonstration plot under the package programme for purposes of propagating soil tests.

2.13 The above narration drives us to the conclusion that the programme of dissemination of the knowledge as well as the importance of soil tests among the ryots is yet to strike roots in the overall scheme of agricultural production programmes. The deficiency seems to lie in the absence of any link up between the soil testing programme and the production programme at village level. Another weakness is the inadequate coordination among the officials of the department, Block and the village institutions. Last but not the least important is the low priority assigned to this programme in the overall scheme of things.

Experience of cultivators in soil tests

2.14 The soil testing programme, as has been seen from the above analysis, is still to take roots, particularly at the farmers' level. Without the proper knowledge of the deficiencies in his soils, the cultivator cannot be expected to follow the recommended dosages of fertilisers and manures. In our household level enquiry, data were collected to ascertain the knowledge and experience of the sample cultivators on this programme. Of the 4,373 sample cultivators, only 54 or 1.23% of them reported that soil tests were carried out in their soils. Forty of these belonged to package districts and the remaining to non-package districts. Nearly two thirds of them were big cultivators having holdings between 5 and 10 hectares. Half of these belonged to the package districts (selected) of Mysore, Punjab and Madras, while the rest were thinly spread over the selected districts of six other States. A large majority of them (47) also reported that their soils were tested during the years 1961-62 and 1962-63. The most revealing part of this analysis was that only 12 out of the 54 reported that soil test results were made available to them with recommendations on fertiliser applications.

Attitude of villagers on the effect of use of Fertilisers on soils, yield of crops, plant growth etc.

2.15 In the 375 villages that were covered for this Study, enquiries were made through discussions with knowledgeable persons and other cultivators to arrive at a village consensus on certain important aspects of fertiliser use. Responses were recorded on the following aspects:—(a) Effect of use of fertilisers on soils; (b) Effect of use of fertilisers on yield of crop; (c) Effect of use of fertilisers on Plan growth; and (d) Effect of use of fertilisers on pests/diseases. The tabulated results on the proportion of selected villages under different responses may be seen in Table No. 2.2 (Appendix). The trends of these responses indicate certain directions in which the extension programme for fertiliser use may have to be oriented, to remove any wrong notions among the farmers arising out of lack of adequate scientific knowledge.

2.16 Regarding the effect of fertiliser application on soils, in a little over a quarter of the reporting villages the view was that this had resulted in depletion of soils, while in about 23% of the villages no such adverse effects on soils were reported. Nearly one-fifth of the villages did not possess sufficient experience in using fertilisers continuously and hence were unable to opine one way or the other. Another 18% villages reported that there will not be depletion of soil fertility if fertilisers are used with organic manures. Adverse effects such as increase in acidity, hardening of soil etc. were also experienced in a smaller number of villages. It is however, clear that there was some hesitation in a good proportion of these villages in using fertilisers, possibly because of the fear that use of fertilisers affected the soils adversely. Scientifically, this may or may not be correct, but the problem of inadequate extension effort in demonstrating the correct knowledge on such an important aspect remains. It may not be out of place to mention here that inadequate knowledge of the basic principles of a practice may become the breeding ground for prejudices, wrong notions etc. This further strengthens the case for conducting large scale soil tests and systematic coverage of fields belonging to different soil types and educating the farmers on the proper doses to be used, both in relation to soils and crops.

2.17 In regard to the yield of crop due to fertiliser use, a little under 1/3 of the total villages reporting (350) were positive in affirming an increase in yield, while 61 villages or about 17% reported that there was no perceptible effect on yield. This category also covered a few villages which reported decrease in yield. Nearly 20% of the villages did not have any experience in using fertilisers continuously. According to two other important categories constituting nearly 1/3 of the total number of villages increase in yield on account of fertiliser use was subject to certain other conditions. For instance, one view was that once started the use of chemical fertilisers should be used without break if the yield levels are to be maintained. Another view was that use of organic manures along with fertilisers only can give higher yields. It is possible that the available organic matter and the other soil nutrients get exhausted heavily over each crop season because of the application of chemical fertilisers. Moreover, the vast majority of our farmers have been using local manures of organic type from times immemorial and it will take time for them to get convinced of the heavier doses of chemical fertilisers now advocated.

2.18 It is common experience that use of chemical fertilisers promotes better plant growth. But at the same time, indiscriminate application may result in too much of growth and lodging of the crop, particularly in the case of rice. More than half of our reporting villages indicated that fertilizer use facilitates better plant growth; in contrast only 2% of the villages reported adverse effect on plant growth. A good proportion of villages did not have much experience on this aspect also. The remaining one fifth of the villages reported that if fertilisers are not used judiciously, the crop would lodge or plant growth will be better only under irrigated conditions.

2.19 Regarding the effect of fertiliser use on plant pests/diseases, in nearly 41 per cent of the villages the view was that there was no particular relationship between the fertiliser use and occurrence of pest/disease. About 12% of the villages reported that the incidence of pest/disease had decreased because of use of fertilisers, while contrary opinion was expressed (increase in the incidence of pest/disease because of likely plant growth) in 15% villages. It may be that there is no particular relationship between the two; but there appeared to be strong opinion in the villages that good growth of the plant might prove an invitation to pests/diseases.

2.20 The above analysis points to the urgent need to strengthen the average farmer with better technology and skill, so that a high priority input like this, does not suffer in implementation because of inadequate or wrong understanding of the programme. However, the position obtained at present in the countryside on the use of fertilisers, is not so much the problem of inadequate knowledge of the type of fertilisers (as will be seen from the later analysis in this report) but the lack of knowledge of the correct dosage based on nutrient deficiencies in the soils and the type of seed and other methods to be followed simultaneously. An integrated approach by way of package of recommendations, as adopted in the intensive districts, seems to be the immediate answer.

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CHAPTER III

ADMINISTRATIVE SET UP AND EXECUTION OF THE PROGRAMME

3.1 The growth in the fertiliser consumption over the Plan period necessitated the creation of suitable machinery for handling the various administrative, distribution and extension aspects of the programme at different levels. A large number of cultivators are still dependent upon the local manurial resources such as farm yard manure, green-manure, oil-cakes etc. for cultivation of crops. Although use of chemical fertilisers is advocated for increasing crop yields, the importance of augmenting local manurial resources by scientific and improved methods of preservation etc. cannot be minimised. In the successive Five-Year Plans adequate stress has been laid on extending the areas under green manure cultivation, better preservation of farm yard manure and preparation of scientific compost. Special schemes have been drawn up and are being implemented by almost all the State Governments as part of the Plan schemes. In this Chapter an analysis of the existing administrative, distribution and extension arrangements for chemical fertilisers and production of local manurial resources, is attempted.

Chemical Fertilisers

3.2 The administrative set up in charge of planning and implementation of fertiliser scheme at the levels of State, district, Block and village was examined in the course of this Study. In all the States covered for Study, it is the Director of Agriculture who is in the overall charge of planning for the fertiliser programme. Planning in this context meant assessment of the requirements of chemical fertilisers of various types, preparation of indents and placing such indents with the Central Fertilisers Pool. The two items last mentioned are relevant only for nitrogenous fertilisers. In respect of phosphatic and potassic type of fertilisers only, the assessment of requirements and fixation of targets for each year are done by the Director of Agriculture. Since both production and distribution of these types of fertilisers are in the private sector, there is not much of responsibility vested with the Director of Agriculture in implementing programmes in relation to these types, excepting the promotional activities relating to use of these. In regard to planning and implementation of the fertiliser schemes, the Agriculture Department thus plays the key role in most of the States. The set-up under the Director of Agriculture with varying designations in different States, indicates that sufficiently senior level technical officers are placed in charge of this programme. Wherever it is not so, there is need to place this programme under the charge of an exclusive senior officer.

3.3 At the district level the D.A.O. is in charge of assessing the requirements of chemical fertilisers in the district in most of the States. He is the technical officer of the department whose primary job is to work out realistic targets. But in the majority of the States his role in recent years has been confined to tendering advice on the technical as well as supply aspects of this programme, either to the head of the district administration (Collector) or to the popular body such as the Zilla Parishad. The responsibility for implementing the programme of fertiliser such as further allocations tc blocks, receipt of such allocations from higher levels, arranging distribution through specified sources etc. are vested either with the official machinery such as the District Development Council headed by the Collector or the popular body Zilla Parishad. The D.A.O. is duly represented on these bodies and as such is also responsible for proper implementation of the programme on behalf of these bodies. The major trend observed in the course of the Third Plan was, that while planning and implementation of the decisions largely came under the purview of the District Level Committee or Zilla Parishad, the actual handling of fertiliser receipts (pool fertilisers only) was entrusted to the Cooperatives on a monopoly basis. It was only in West Bengal, Kerala, Rajasthan and Orissa, no such monopoly rights were vested with the Cooperatives for distribution of N type of fertilisers, but these were entrusted with this work besides the departmental, Panchayati Raj and private agencies. In Himachal Pradesh the department of agriculture directly deals with the distribution of fertilisers and as such the panchayats and cooperatives do not play any role in this regard.

3.4 At the Block level the B.D.O. is in overall charge of planning and implementation of the fertiliser programme. The Agriculture Extension Officer and the V.L.W. assist him in assessing the village-wise requirements of various types of fertilisers. The consolidated estimate of the requirement is then sent to the DAO/Zilla Parishad/District Development Council etc. The allocations received against such indents are further allocated V.L.W. circle-wise depending upon the crop needs in different villages. The actual handling of distribution is not, however, done by the Block agency in a majority of States. To the extent Panchayats also are associated with this work in certain States like Rajasthan and Orissa, the supervision of physical distribution of fertilisers also vests with the Block level extension staff.

3.5 At the district level, as already mentioned, the D.A.O. plays a key role on the technical as well as supply aspects of the Fertiliser programme. He discharges his responsibilities in this regard either directly on behalf of his department or through the democratic body of which he is a part. In recent years there has been an increase in the number of district agricultural officers in a revenue district. Thus at present these officers are in charge of compact and manageable charge in a good number of cases, compared to their position ten years ago. There is also an urgent need to orient the D.A.O's work more to the extension aspects of the programme rather than the routine administrative and supply functions. If the D.A.O. has to play such an extention role effectively, there is need to provide him suitable assistance to take care of the purely administrative and supply functions. Therefore, the feasibility of providing a 'Fertiliser Officer' of the status of a D.A.O. for each revenue district (to handle all the supply and other routine functions) under the Zilla Parishad or the District Development Council needs to be examined.

3.6 The set up at the Block level seems to be adequate as far as the present arrangements show. By and large, the supply functions are taken away from the A.E.Os and V.L.Ws. in most areas. They are now concerned in many areas with mere extension functions. But what may be necessary at this level is, that the B.D.O. should be vested with full authority and responsibility for planning, programming and achieving the targets of fertiliser distribution in his area. All aspects of the fertiliser distribution programme including credit should come under the close purview of the B.D.O. and thereby the panchayat samiti of which he is the chief executive.

Local Manurial Resources

3.7 As part of the Agriculture Department, in most States, there is a separate set-up administering the various schemes related to the production of local manurial resources. Except Assam, all the other States have State level officers exclusively in charge of 'Local Manurial' resources. In most States they are designated as 'State Compost Development Officer'. In some States such as Punjab and Andhra Pradesh, they are known as 'Field Manure Officers.' The administrative set up at this level appears to be adequate in most of the States. At the levels of district and block there is no uniformity in the pattern of staffing for this programme. In the States of Madhya Pradesh, Punjab, Mysore and Maharashtra there are officers known as Compost Development Inspector/Field Manure officer both at the district and block levels. In the States of West Bengal, Bihar, and Gujarat, there are only district/or divisional level officers but no block level functionaries. The pattern in the States of Andhra Pradesh and Madras, shows that there are only divisional and Block level functionaries. In the remaining States (Orissa, Uttar Pradesh, Rajasthan and Kerala) next to the State level officer, there are only block level functionaries designated as Compost Inspector/ Manure Inspector.

3.8 Over the Plan periods, considerable importance was attached to the development of local manurial resources. Provision of trained technical staff was only one of the various requisites, and to the extent separate staff was warranted for this programme, the same had been provided in most of the States. But it may be observed that creating too many specialists for segments of the same programme at the block level may not promote a unified approach to the implementation of closely related programmes. For instance, in extending the use of fertilisers and manures such an approach is all the more essential as maintenance of soil fertility and balanced fertilisation are the principal objectives. Even a compost development Inspector at the Block level has to work through the V.L.Ws. to achieve certain targets fixed. This is also a programme the success of which very largely depends upon the suitability of the areas in terms of local potential and the active involvement of a large number of cultivators. A 'package approach' to all agricultural problems at this level, is necessary and the A.E.O. should be able to achieve the desired objectives even in regard to development of local manurial resources. Thus there does not appear to be sufficient justification for a compost development extension officer at the block level. The same argument holds good for the district level also, but the D.A.O. may need some technical assistance for coordinating the different segments of the agricultural development programmes. Therefore, the staff now available for manure programmes at the district level should become part of the D.A.O's set-up wherever it is not so.

CHAPTER IV

PLANNING, METHOD OF FIXING TARGETS, WORKING PROGRAMME ETC.

4.1 Planning for a programme implies assessment of resources both internal and external, assessment of needs in terms of areas and other components of the programme, allocation of available resources equitably and according to the needs, and adoption of proper methods and techniques so that planning becomes realistic and purposeful. Once a sound plan is prepared, a detailed working programme becomes necessary to achieve the intended objectives. In this Chapter, an attempt is made to analyse the process of target fixation, preparation of working programme for achieving targets, both for the fertiliser programme and production of local manurial resources. It may, however, be noted that the discussion relating to fertilisers is largely relevant to nitrogenous fertilisers only as for the other types there is not much of planning done except mere indication of targets of quantities to be achieved over a period.

Chemical Fertilisers

4.2 **Fixing of target:** Targets for distribution of fertilisers are generally fixed at the State level by the agriculture department and approved by the planning and development departments of the State Governments. Madras State is an exception where it is neither the department of agriculture nor the planning department but the Revenue Board which fixes the targets for chemical fertilisers. The targets are generally linked to agricultural production targets indicated to the various States by the Planning Commission at the time of Annual Plan discussion. Even in the case of States where State level targets were attempted on the basis of planning done from below, as in Assam, Uttar Pradesh and Bihar, final targets were fixed from above at the State level.

4.3 Targets for a State are, by and large, broken down to division, district and block levels. In Uttar Pradesh these are further broken down to the village level. The village institutions, however, are not fully associated in the process of planning at this level. In Assam, estimates for each village prepared on the basis of the previous year's consumption, together with the margin for additional requirements for the ensuing year are considered for the purpose. In West Bengal, targets fixed for the last year of the Third Plan formed the basis for arriving at the annual targets which were finally broken down to the lower levels. In Orissa, the yardsticks for target fixation have been specified in terms of overall production of agricultural commodities in the State. In Mysore these were worked out annually for each Plan on the basis of the indents forwarded by the District Agricultural Officers. The formula adopted for this *ad-hoc* basis was to multiply the area under the crop by the recommended dose of fertilisers in order to arrive at the total quantity required. In the remaining States one or the other procedures mentioned above was followed for fixing the targets for chemical fertilisers.

4.4 These illustrations on the basis of fixation of targets in different States indicate that there is no standard method adopted by the State Governments in arriving at a realistic procedure. While the basic

the area relevant for fertiliser use in different parts of the State,
ie recommended dosage, it may not, however, be very realistic to
: total area, multiplied by standard dosages. In some States the
argets are worked from village level and above. In the rural con-
illage should be the effective unit for purposes of planning. But
e of chemical fertilisers, the production and supply of which is not
sured for the entire area, considered relevant, fixation of targets
o be related to the consumption of fertilisers in previous years.
ates follow the method of linking up fertiliser targets with the
agricultural production targets envisaged for a plan period.
constitute one of the crucial agricultural inputs capable of
about significant increases in agricultural production.
chievement of additional targets of agricultural production is not
pendent on chemical fertilisers as a number of other contributory
e to be reckoned with. Perhaps, it is necessary to examine the
each individual region within a State in terms of the potential for
on based on irrigation, etc. A beginning has already been made
rection under the Intensive Agricultural District Programme,
High Yielding Varieties scheme, etc. Special quota of fertilisers
earmarked in recent years to such areas. Fertiliser targets should
on farm production plans wherever these are prepared or previous
erformance and the recommended doses for different crops. The
y or otherwise of various other types of organic manures such as
green manure, farm yard manure, etc. should also be taken into
ion in the assessment of chemical fertilisers.

emand and allocation of fertilisers: In the course of this field
n attempt was made to study divergence between demand and allo-
fertilisers at the State level and the effect of such divergence on
ement in terms of distribution of fertilisers. Table No. 4.1
() may be seen for Statewise data. Among the States reporting,
s 9* of them had indicated that the allocation of fertilisers was
lemand while only in States viz. Gujarat and Rajasthan, the same
ess of demand. Allocation had remained less than demand dur-
ervening period of the end of Second Plan and the first two years
Plan in most of the States. There was perceptible improvement,
n the position of allocation over demand during the second year
Plan in Bihar, Andhra Pradesh and Punjab. In Rajasthan the
was in excess of demand at the end of the Second Plan but fell
ng the first and the second years of Third Plan. No specific
ere reported for one or the other situation reported above except

achievement in terms of distribution of fertilisers had been found to be less than both the demand and allocation irrespective of the fact whether allocation was more or less than demand. Rajasthan and Himachal Pradesh are exceptions wherein achievements during the first and second years respectively of the Third Plan were reported to be in excess of allocation presumably due to the carry-over of surplus stock of the earlier years. Most of the other States had attributed the shortfall in achievement to familiar reasons such as ambitious targets, low demand, administrative lacunae, etc. but not on account of short supplies of these.

4.7 The position, on the whole, appears as though there was no specific relationship between allocation and achievement in terms of distribution of chemical fertilisers. The defects mentioned earlier in regard to the methods of fixation of targets must be responsible for such a lack of correlation as between allocation and demand. It is quite possible that the high targets necessitated higher allocations but due to lack of adequate demand the allocations were not fully utilised. The converse of this may be true in some other States where the demand was quite high but the targets were fixed modestly and hence allocations fell short of demand. A corrective to this situation should be sought in the adoption of a proper basis for the fixation of targets themselves on a rational and more realistic basis.

4.8 **Production of local manurial resources:** The formulation of targets for production of local manurial resources among different States, was generally based on the availability of local manurial stocks and potential production capacity of the various sources. In a majortiy of the States rural compost, town/urban compost and green manure, constituted the principal types of organic manures. In West Bengal, there was a scheme known as 'Sledge distribution' in operation for some time. The programmes sponsored under the various Plan schemes covered all the types of organic manures mentioned above.

4.9 The targets fixed for rural compost in a good number of States were based on the livestock population of the village. Adult population as furnished by the Block Survey Report and Livestock census 1956, were the guiding factors in Andhra Pradesh and Mysore respectively. In West Bengal, the rural population was the basis for fixing the targets on local manurial resources; the estimate being that two lakh tons of compost could be produced per year by families with three heads of cattle each using only 20 to 30% cow-dung for the purpose. In Orissa, certain yard-sticks assigned to various input factors were taken into account while fixing targets. Targets for urban compost and sledge distribution were fixed on the criterion of the urban population and the production capacity of the sources of production, viz., Municipalities. For green manures the areas for growing these crops, availability of seed, cultivators' response and other seasonal conditions were taken into account while fixing the targets.

4.10 Production of organic manures are closely linked up with the local resources and planning for this should necessarily start at the village level. The village panchayat can play a very significant role in this programme. But experience uptill now does not indicate that these institutions are actively associated in the process of formulating a plan for production of organic manures, except in a few States such as Madras, Mysore and Andhra Pradesh. The ultimate success of this programme depends upon some important factors. Firstly, increasing the production of farm yard manure and rural compost very largely depend upon prevention of the use of cow-dung for fuel purposes. Secondly, the availability of irrigation water for growing the green manure crop either prior or after cultivation of a crop determines the success of green manure production. Thirdly, the availability of green manure and other materials needed for compost also determines the extent of compost production in an area. Finally the improved methods of preper-vation of farm yard manure, production of rural compost and cultivation of green manure crop, depend for their success on the willingness of the cultivators to adopt these. Suitable facilities and inducements are called for besidés effective extension work among cultivators. Fixation of targets will not convey much meaning as long as the basic problems in popularising these programmes are not tackled. Even with small outlay on such schemes the results could be quite rewarding.

4.11 The achievements of this programme in relation to the targets fixed for various States, revealed the following position. Among the States reporting shortfall in achievement, the important reasons reported were lack of interest besides inadequate efforts on the part of the extension staff. These are, of course, too very general but at the same time prevalent on a large scale. In West Bengal, however, the problem was of a peculiar nature. For instance the occurrence of floods were responsible to a great extent for the shortfall in programme of urban compost production. Except in a few States such as Madras, Kerala and Punjab, the progress in the production of quality compost was somewhat disappointing. In actual practice cultivators were preparing only farm yard manure in a better fashion in some cases and not quality compost as such. Compost preparation was complicated as also labour-consuming. The shortfall in achievement in compost production was attributed to lack of fuel, lack of additional materials by way of refuse, lack of grazing facilities, want of adequate space near the villages etc. In the States of Bihar, Uttar Pradesh, Rajasthan and Orissa, considerable extent of cow-dung was reported to be consumed for fuel purposes. In the States of Maharashtra, West Bengal, Punjab and Mysore, although the production of urban compost was quite satisfactory, the apathy on the part of the cultivators to use urban compost impeded the programme to some extent.

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4.12 The programme of green manure cultivation is yet to make a headway in a large number of States. The shortfall in the achievement of the green manure production was due to inadequate supply of seed, lack of irrigation facilities, unsuitability to cropping pattern, soil and climatic conditions, lack of fencing facilites etc. The rate of adoption and extension of green manure were observed to be very low in Madhya Pradesh. Assam, Uttar Pradesh and Orissa. There was not much of a vigorous campaign towards achieving better results in these States.

4.13 **Working programme for achieving the targets :** The process of fixing targets is only one aspect of any plan scheme. The achievement of such a target implies careful programming of a number of related aspects having a bearing on the main programme. Unless this is worked out in sufficient detail with certain amount of foresight and imagination, targets are not likely to be achieved. In the case of the fertiliser programme, achievement of targets for a given period and area depends upon a number of agencies concerned with the programme. Besides the Agriculture department, Irrigation, Panchayati Raj, Cooperation and Revenue departments are directly concerned with the implementation of this programme at different stages. Also private agencies connected with manufacturing and distribution of some of these materials, as also the voluntary agencies such as youth clubs, farmers' associations etc., are in a way associated with the implementation of this programme. For achieving the targets of fertiliser distribution, a coordinated approach is, therefore, called for.

4.14 In the course of this study, this aspect was examined in some detail at the various levels and an attempt is made in the following paragraphs to analyse the field situation as obtained at the time of our enquiry. In view of the importance attached to this major agricultural input, it is perhaps time to take stock of the situation and indicate directions calling for a change. The first aspect relates to whether any detailed working programme was prepared comprising proposals of action for achieving the targets fixed for different levels. In as many as 12 out of 15 States, no efforts were made to prepare a working programme for achieving the targets. Only in Maharashtra, West Bengal and Kerala that some attempt in the nature of a working programme was reported. Otherwise the general method followed in the majority of the States was to break up the targets fixed at the State level to the lower level administrative units down to the block or village. In West Bengal, on the basis of the review of past performance in regard to distribution, those distributors who proved inadequate to the job and who were weak links in the system were weeded out in the process of revitalising the set-up. In Maharashtra, the State level targets were split up district-wise and communicated to Zila Parishads and Panchayat Samities. Here the process was a little democratised than in other States as the targets were worked out from below. In Kerala, the fertiliser target formed part of the Block production plan which was also built from below. Such plans approved by the State Planning Board were communicated later to the district officers for follow-up action.

4.15 The working programme for fertiliser promotion has two crucial aspects. The first one is supply arrangements and the second one is credit extension. In both these aspects, a number of agencies, governmental and otherwise, are directly involved, and, therefore, operational coordination is imperative to achieve success. Availability of the material in time, at reasonable distance and on credit basis to a considerable extent are the determining factors on the use of fertilisers. Judged from such minimum needs of the programme, it was observed that a comprehensive and coordinated working programme was yet to be attempted in majority of States.

4.16 The programme at the district level, by and large is expected to reflect the thinking and policy enunciated at State level. In 12 out of 38 districts, no working programme as such was reported. In these, the usual exercise of splitting up the targets received from above was, however, done. But the introduction of package programme facilitated an integrated approach to agricultural production programmes. Provision of all the agricultural inputs including fertiliser on the basis of farm plans and also credit for purchase of these was ensured in these districts to a large extent. Arrangements were also made for periodical review of achievements. In some of the non-I.A.D.P. districts, such as Azamgarh, Cooch-Behar, Karimnagar, Muzafferpur and Yeotmal, more realistic and integrated approach was noticed in communicating the targets to lower levels. In Shahabad and Bhandara districts, working programme was reported to have been chalked out before every crop season and a calendar of events for each item of the programme such as placing of indents, receiving supplies, distribution outlets and the officer at each level responsible to implement the programme, was also prepared.

4.17 The working programme at the Block level did not mean anything more than the splitting up of the targets indicated from above, V.L.W. circle-wise. However, in some of the Blocks, care was taken to assess the availability of irrigation, crops grown etc. while splitting up targets upto village level. In some of the other Blocks, such as Nahan and Paunta blocks of Sirmur district and in the two blocks of Cooch Behar, the targets were not even broken down V.L.W. circle-wise. In most of the selected blocks the A.E.O. at the Block level and V.L.W. at the village level were assigned with the responsibility for achieving the targets of fertilisers.

4.18 **Provisions of Credit :** In regard to the provision of credit for fertiliser purchase, the usual institutional sources available in most of the States were (i) Cooperatives, and (ii) Taccavi loans issued by the Government departments such as Revenue, Agriculture, etc. For achieving the targets fixed for the Third Plan there was not much change in the content nor in the form of providing these over and above the levels of the Second Plan period. However, in certain States such as Punjab, U.P. and Bihar, the maximum credit limit had been raised. Cooperative credit had also been linked with the issue of fertilisers in Orissa and Uttar Pradesh. In Maharashtra and the three southern States, the issue of taccavi loans was linked with the issue of fertiliser, but the bulk of the cooperative loans were issued in cash in all the States. It was only in the I.A.P.D. districts, a more effective approach in the issue of cooperative loans and distribution of fertilisers had been worked out.

4.19 Generally, it was observed that the cooperative structure was still weak in a large number of States. The loans issued by them were not always production-oriented, and there were no checks to ensure proper utilisation of these loans. Many of them also suffered from lack of adequate facilities to trade in fertilisers. Thus, the ambitious targets fixed both for agricultural production and fertilisers were found to be difficult of achievement in majority of the States. The experience available in the I.A.D.P. districts should make it possible to build up supplies of all agricultural inputs including cash loan to cultivators on the basis of farm plans. There is also need for provision of suitable facilities such as godown, managerial assistance etc. to cooperatives capable and desirous of taking up such functions. The initial efforts of such cooperatives could be limited to a group of villages (potential users) instead of dispersal of efforts thinly and through cooperatives of every description. What is more important is, that at the level of Block and district a clear picture should be given, of the extent of facilities that could be provided in relation to finance available in a particular year. Without such knowledge it would be futile to insist on any realistic working programme to achieve targets.

4.20. **Role of Voluntary Institutions :** The role assigned to panchayats, farmers' associations and other voluntary agencies in achieving the fertiliser targets was also examined. In majority of the States these bodies were not involved in any significant way in this programme. In some of the States, the panchayats played a limited role in as much as they were required to prepare a production plan. They were also engaged in actual distribution of fertilisers in a few other States, particularly in areas where cooperatives were not functioning. In Maharashtra, Orissa and Andhra Pradesh, panchayats were required to prepare production plans but no direct responsibility was vested with them for fertiliser programme. It was only in Rajasthan, the Sarpanch of the panchayat and the production committee of the panchayat samiti were held responsible for achieving the fertiliser targets.

The role of the farmers' associations etc. was generally found to be superficial in most States.

4.21 Thus, panchayats are yet to be actively involved in the scheme of agricultural production in general and fertiliser programme in particular. Perhaps, it would be too very ambitious to expect any major involvement of these institutions in a programme of this nature, the supply, credit etc. are all determined by external agencies. It would be more reasonable to entrust them with the programmes of local manurial resources in which they can play a more fruitful role.

4.22 **Farm planning:** With the advent of I.A.D.P. in selected districts, local planning was given a new orientation and efforts in this direction became more systematic. For all the cultivators participating in the programme a simple production plan was required to be prepared. The main objective of such a production plan was to assess the requirements of each cultivator for the various improved inputs and also the necessary credit to purchase these. Timely supply of such requirements to the farms covered under the programme was also to be ensured as far feasible. In a vast country like ours with diverse conditions from one region to the other, such planning at the level of farmers takes time to take roots.

4.23 As the preparation of simple farm production plans had been initiated in package districts, it was considered worthwhile to study the initial reactions of the cultivators to such farm plans. A few special questions were asked to our selected respondents (package districts), as to their participation in the package programme, whether production plans were prepared for them items covered in such plans, whether they were following these plans etc. Such data were collected for two years viz. 1961-62 and 1962-63. Table No. 4.2 (Appendix) contains data on this aspect. This analysis showed that less than one-third of the sample respondents were participating in the package programme during these two years. Secondly, a large proportion of cultivators reported coverage of all four principal items in their production plans, viz. fertiliser, compost, green manure and credit. Thirdly, the number reporting following the production plan was a little over 50% in most of these categories during both these years. Fourthly, both the number of participating cultivators in the package programme as also number reporting production plans for different manurial and credit items had increased during 1962-63.

4.24 In Table No. 4.3 (Appendix) data on the average quantities of inputs per cultivator planned, used/produced etc., are presented for two important food crops viz., paddy and wheat and for the two years referred in the earlier paragraph. These data relate to the respondents reporting production plans in these two years and those among them growing these crops. The three principal types of chemical fertilisers, two types of organic manures and credit are presented in the table. In respect of both these crops, the gap found between planning and implementation for 'N' type of fertilisers in the first year had been considerably reduced in the second year. For wheat crop the average consumption per cultivator exceeded the planned quantity. But in respect of the other two types (P and K), the consumption was very much below the planned quantities (except K for paddy crop during 1962-63). While K type of fertiliser was relatively less important, the shortage in the use of 'P' type was somewhat disconcerting.

4.25 Application of compost and green manure appeared to be more relevant for paddy crop in both these years. The data also relate mostly to the southern States, Madhya Pradesh and Gujarat. Both planning and implementation for compost production was realistic during 1961-62 whereas during the latter year the plan for compost was highly ambitious. The production of about 38 quintals on an average per cultivator during 1962-63 was quite encouraging. Area planned as well as achieved under green manuring was rather low in both these years for paddy crop for which this was largely relevant. The average requirements of credit per cultivator was low for paddy crop during the first year, while there was some improvement in planning for this item during the latter year. Achievement, however, fell short of even this modest requirement for both the crops. On the whole, it can be stated that farm planning as an instrument of increasing agricultural productivity had a good start in the package districts and needs to be followed up with greater care and vigour.

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CHAPTER V

DISTRIBUTION AND EXTENSION

5.1 The use of fertiliser on a large scale in a country such as ours depends upon a number of factors. Among others, the arrangements made for effective distribution of fertilisers, facilities and inducements offered to cultivators and the level of extension efforts undertaken in the vast number of villages largely determine the success of this programme. In this study, these three aspects were examined in some detail at different levels of implementation, and in this chapter an attempt is made to bring out the field situations prevailing in the different parts of the country.

(a) Distribution arrangements

5.2 The policy of the State Governments in opening fertiliser distribution points was discussed with the concerned authorities. The criteria followed in most of the States were the convenience and making available fertilisers to the cultivators, either within the village or within their easy reach. In some States a distance of about 2 to 3 miles was considered as easy reach and in some others upto 5 miles or a little beyond also was considered as such. However, the initiative to open a distribution depot for fertilisers rested mainly with the Block authorities. Where the cooperative failed to handle or hesitated to undertake the job, the distribution was entrusted either to the V.L.W. or the department. In the district of Burdwan (West Bengal) cooperatives were unable to take up distribution for want of working capital and storage facilities. In this area the private dealers also did not open their sale points in the interior areas. As a result, the distribution programme did suffer to some extent, particularly in villages situated in the interior. The inadequacy of outlets for interior villages existed in a large number of States and hence calls for proper planning of the distribution outlets based on the quantum of fertilisers allotted to the States from year to year and various other factors. Our field observations show that working out a realistic programme of opening adequate number of distribution depots is still to be thought of at the highest level in a large number of States.

5.3 In almost all the States three types of distribution agencies are engaged in the distribution of fertilisers. First comes the cooperative institutions, which in recent years have been handling bulk of the fertilisers allocated to a State. In some of the States, such as West Bengal, Assam, Himachal Pradesh and Kerala where the cooperative system is yet to expand, quite a considerable quantity of fertilisers is handled by private traders and the departmental agencies such as Block depot or the depot of the Agriculture Department. In a few States, other agencies such as panchayats, farmers' unions etc. are entrusted with the distribution of fertilisers. In Uttar Pradesh Cane Unions are also operating in the field of fertiliser distribution.

5.4 In table No. 5.1 (Appendix) districtwise data on the number of distribution points existing at the end of First Plan, end of Second Plan and the first two years (viz. 1961-62 and 1962-63) of the Third Five Year Plan are presented. According to this at the end of the First Plan period the cooperatives constituted only about 30% of the total number of distribution points functioning in these districts. This increased to 45.6% by the end of the Second Plan period. During the first year of the Third Plan, the proportion of cooperatives was 70.3% and in the subsequent year i.e. 1962-63, it touched the highest level of 78%. This is somewhat significant particularly from the quantitative growth of the number of cooperative outlets in this field. The number of cooperative depots increased almost 25 times from about 261 at the end of the first Plan period to little over 6,600 during the year 1962-63. As between individual States and also as between package and non-package districts, there are marked variations indicative of the unevenness of the growth of the cooperative movement in the different parts of the country. However, it may be noted that in most of the package districts, the growth of cooperatives has been higher than in the non-package districts. States such as Gujarat, Maharashtra, Madras, Mysore, Punjab and Uttar Pradesh show better performance in the cooperative field particularly in the recent years.

5.5 The proper location of supply points largely determines the effectiveness of fertiliser distribution. It is reported that in about one-third of the selected Blocks the distribution points were not located conveniently from the angle of facilitating speedy movement. In some of the Blocks studied in Rajasthan, Maharashtra, Mysore, West Bengal, Madras, Punjab, Orissa and U.P., this situation was prominently reported. Inadequacy of supply points was also reported in some of these Blocks. In the remaining two-thirds of the selected Blocks, it was reported that there was no problem of inconvenient location or inadequate number of sale points. However, in hilly areas, where communication and transport facilities are comparatively less developed, it was difficult for the authorities to locate the sale points at convenient places. During rainy season, access to such areas becomes all the more difficult. The heavy cost of transportation makes it an uneconomic business and the cooperative societies do not also come forward to undertake this job in such areas. Inadequacy of storage facilities, particularly in the less developed areas, is said to be another serious obstacle impeding the progress of location of distribution points at convenient points. Thus it appears the problem of hilly and less developed tracts needs to be tackled on special considerations.

5.6 Private dealers are quite active in fertiliser distribution in almost all the States. Besides the non-pooled fertilisers such as Super-Phosphate, Ammonium Phosphate and mixture grades, there are also private licensees authorised to sell pooled fertilisers in some of the States. Probably, it is in the interest of the programme of fertilisers distribution that an element of competition is allowed as between the cooperatives and the private agencies. This is there already in the sphere of uncontrolled fertilisers. But the phenomenal growth of the cooperative depots in recent years, would not have been possible but for the monopoly sector trading for the cooperative distribution entrusted to them. Whether such monopoly should continue for ever, is a question that needs careful examination in the light of past experience. In a good number of cases, the cooperatives have not been able to give a satisfactory account in this particular task, for a number of reasons such as, inadequacy of the margin of profit, absence of suitable godown facilities and lack of necessary working capital and credit accommodation, transport and other communication problems. Because of such factors, it is probably more profitable to entrust the job of fertiliser distribution (all types) on a competitive basis both to the cooperatives and private traders.

It is only then that such of those cooperatives which are rendering an efficient account of their functoning can survive in the field and probably this would also act as an incentive to similar institutions elsewhere to follow strict business principles. Private trade should also be regulated by a system of licensing and periodic inspection of their stocks so as to prevent adulteration, selling of sub-standard mixture grades, etc. The successful functioning of FACT in Kerala State should serve as a good example for the private trading interests in this field of fertiliser manufacture and distribution.

5.7 In our enquiry at the cultivator's level, the sources of fertiliser supply as also the quantities obtained by them from various agencies were ascertained. In Table No. 5.2 (Appendix) sample data are presented package and non-package districtwise indicating the proportion of respondents availing the different sources of supply in the years 1961-62 and 1962-63. Table No. 5.3 (Appendix) gives the proportion of various types of fertiliser supplied to our selected respondents by different agencies in the same years. A few broad inferences may be drawn from those two tables. From the first table, it may be noted that in the package districts over three-fourths of our respondents resorted to cooperative societies for fertiliser supplies in these years. Less than one-fifth of the respondents only resorted to private agencies during these years for their supplies. It may be noted that in the latest year, viz., 1962-63 there was a slight fall in the proportion of respondents seeking supplies from private traders. Governmental agencies catered to about 3 to 4% in both these years in the package districts. Besides these, there were also few other sources serving about a little over 3% of our respondents in package districts.

5.8 In contrast to the above, cooperative served about 56 to 60% of our respondents in these two years in the non-package districts. Private traders supplied fertilisers to nearly one-third of our selected respondents in these districts. Governmental agencies also played a much bigger role (9 to 11%) in non-package districts. Cultivators resorting to sources other than these three, constituted a negligible minority in the non-package districts.

5.9 As between different States the sources of supply to our selected respondents vary considerably. However, it may be concluded that at the beginning of the Third Plan, cooperatives constituted by far the most important source for majority of cultivators in different parts of the country. The proportionate quantity supplied to our selected respondents in these two years, also indicates a similar trend, in as much as nearly 87% of the nitrogenous fertilisers and 75% of the phosphatic fertilisers in 1961-62 and still higher proportions of these two types in 1962-63 were supplied by the cooperative agencies. There was not much difference in the quantum of fertilisers supplied by private agencies in both these years. However, it is significant to note that the bulk of fertilisers supplied by the private traders are the phosphatic types and mixture grades which are outside the pool. It is mainly on account of the monopoly rights vested in them that the cooperatives have been able to play a dominant role in the distribution of nitrogenous fertilisers in both these years. At the same time it has to be taken note of that the cooperatives handled considerable quantities of phosphatic fertilisers and mixture grades also in both these years, particularly in the package districts. This must be due to the package of practices advocated as per farm plans. The quantities of fertilisers supplied, both by the Governmental agencies and 'other sources' are negligible.

(b) Facilities and inducements

5.10 Use of fertilisers at the cultivator's level, particularly in the initial stages, depends upon the facilities and inducements offered and also the level of extension effort that goes along with such facilities and inducements. In this section an attempt is made to analyse the types of facilities and inducements that were offered to cultivators in our sample areas. Our focus was also, to some extent on the type of expansion contemplated for the Third Plan period. Organising adequate number of sale depots and streamlining of the same constitute so one of the important facilities for the large number of cultivators who use fertilisers. In the context of the Third Plan, it was necessary for the State Governments to prepare themselves adequately to meet the growing demand for fertilisers by way of organising additional sale depots. Our observations showed that in 10 out of 15 States, there were definite plans to increase the sale depots to cope with the increased demand for fertilisers. Steps had already been taken in these States to increase the number of sale depots. In Madras, 252 depots were proposed to be started as per the recommendations of a special officer appointed to examine the question of equitable distribution of fertilisers in the State. Similarly, in Cooch-Behar district of West Bengal also the Government had decided to set up three departmental stores in each Block. There were no definite plans, however, in some of the other States.

5.11 Offering of timely and adequate credit to cultivators is another important facility that was reported in a good number of States. Three types of loans are advanced in most of the States. The first is the short-term loan issued through the cooperative societies out of the funds received from the Reserve Bank. The second is the departmental loans issued in the form of taccavi loans or intensive manuring loans. The third one is the loans offered by private traders of fertilisers on credit basis to cultivators. Regarding the adequacy of the first two types of loans, in most of the States considerable expansion was reported in both these types at the beginning of the Third Plan. Most of the State Governments had also thought of further expanding such credit facilities in the remaining years of the Third Plan. But even with such expansion, in a good number of States the extent of credit was considered inadequate to promote the use of fertilisers at the expected levels by all cultivators.

5.12 The disbursement of loans in a majority of the States was both in the form of cash and kind, the former exceeding the latter in a good number of cases. The main bottleneck reported in giving the entire amount of short-term loan granted to a cultivator in kind was that the cooperatives in a good number of instances were not dealing in the items required by the cultivator for his production programme. In such cases, credit had to be disbursed in cash and it was expected that the cultivator would have purchased fertiliser and other inputs from sources where these were sold. Out of the 75 Blocks studied, only in 21 Blocks short-term loans were issued in kind (Maharashtra, Orissa, Madhya Pradesh, Uttar Pradesh, Punjab, Rajasthan and Madras) through cooperatives and the departments of agriculture and revenue also in the States of Himachal Pradesh and Assam issued similar kind loans. In another 28 Blocks, both cash and kind credit was extended to cultivators mainly in the States of Andhra Pradesh, Mysore, Bihar, Gujarat and Kerala. Only cash loans were issued in as many as 17 blocks belonging to the States of Rajasthan, Maharashtra, Mysore, Orissa and Andhra Pradesh. This shows that even during the Third Plan period there was not much attention paid to streamline all agricultural loans through a common agency and also issue of such loans in the shape of material inputs required by the cultivators. The above illustrations show that too many agencies are involved in giving credit to cultivators and this will lead to borrowing from more than one agency, particularly when the loans are issued in cash. Another important deficiency is that many institutions engaged in the task of issuing short-term loans are not equipped to deal in the materials required by the cultivators for agricultural production. Because of the growing demand for fertilisers, these scarce materials are to be issued in a more rational way and in such areas where the application is certain. Therefore, issue of major part of the loan to cultivators should necessarily be in the form of fertiliser, seed etc. to ensure the proper utilisation of such loans. Unless measures on the above lines are urgently taken, a time may come when it may not be possible for the authority in charge of the programme to ensure equitable distribution of the loan amounts as well as proper utilisation of these for the intended purpose of such loans.

5.13 Whether fertiliser use is dependent on adequacy of credit was examined in a limited way in this enquiry. In a large number of States it was reported that the major part of the fertiliser sales were on the basis of credit. This indicates that over the Plan periods considerable expansion has taken place in advancing credit to cultivators. There is a more clear-cut trend of credit sale of fertilisers in package districts where issue of credit has been well organised on the basis of farm production plans. It is also incumbent in these districts that part of loan sanctioned to cultivators should necessarily be issued in the form of material inputs. Nearly 50-60% of fertilisers sold in the States of Maharashtra, Uttar Pradesh, Madhya Pradesh, Rajasthan and Himachal Pradesh was reported to be on the basis of credit In Mysore, it was estimated to be about 65%. In Bihar, 90% of the offtake of fertiliser was reported to be on credit in the package district but for the entire State the position was somewhat low. In quite a few States the authorities concerned at the State level were not in a position to indicate the proportion of credit sales.

5.14 Apart from such facilities of opening of credit new sale depots, issue of credit etc. in some States subsidies were also offered in the initial stages for purchase of fertilisers by the cultivators. The following statement shows that in a good number of States subsidies were offered on different types of fertilisers :

EXTENT OF SUBSIDY ON SALE OF FERTILISERS

Sl. No.	State	No. of Blocks involved.	Percentages of subsidy on						Remarks
			Super-Phosphate	Bone-meal	Urea	A.S.N.	C.A.N.	I.A.S.	
1	2	3	4	5	6	7	8	9	10
1.	M.P.	8	25	..	..	..	..	..	..
2.	Punjab	4	25	..	..	..	..	..	..
3.	Rajasthan	6	25	..	..	..	..	..	In two Blocks in addition, the Govt. bears transport charges for supply of fertilisers.

1	2	3	4	5	6	7	8	9	10
4.	Maharashtra .	2	25	..	..	..	..	..	..
5.	(*a*) Bihar	2	20	20	20	..	..	..	..
	(*b*) Bihar	2	20	..	20	20	11	..	..
6.	Assam .	2	25	..	..	..	..	..	..
7.	Kerala .	4	25	25	..	..	..	..	In Vellangallur block the subsidy was 12½%
8.	Himachal Pradesh .	2	25	..	..	..	..	25	Under dry farming scheme.

In Madras State, no subsidy on fertilisers was granted except for one year in the district of South Arcot for package programme for Ragi crop, where 25% subsidy was allowed. Apart from these Blocks, no subsidy in the form of fertilisers was offered to the cultivators in the remaining blocks.

5.15 Data collected from the sample respondents regarding the extent of facilities availed by them in the form of both cash and kind loans for the purchase of fertilisers from the sources of supply of fertilisers, are presented in Table No. 5.4 (Appendix). From this it appears that the proportion of respondents availing such loans is very meagre compared to the total number of respondents canvassed during this enquiry. For instance, in 1961-62, 15.3% and in the subsequent year 16.6% of our total respondents had availed such facilities of cash and kind loans. A break-up of this into package and non-package districts indicates that in these two years about 21% and 23% of our respondents had availed of such facilities in package districts. In contrast to this, during these very years only about 6 and 7% of our respondents in non-package districts had availed such cash and kind loans for purchase of fertilisers from the sources of supply.

5.16 The question of granting a subsidy on fertilisers has engaged the attention of the State Governments from time to time. Even at the time of this study in a good number of States some form of subsidy had been allowed to the cultivators. But since this is a policy issue, it is necessary to examine this aspect closely so as to determine the extent of subsidy and the areas in which these are to be offered. In the initial stages of any new programme when new ideas or materials are being popularised among the large mass of cultivators, probably, there is every justification to build an element of subsidy if it is a material input sold to the cultivator. But as the demand grows for such items and the people realise the value of applying such materials, probably, it may not be necessary to continue the subsidy part of it. In fact, such a practice may leave wrong impressions among the users and may also result in unnecessary burden to the exchequer. So far as fertilisers are concerned, there is no doubt that the consumption level has reached such a stage now that the agencies concerned are not in a position to fulfil the demands of the cultivators. This clearly establishes that there is no justification for granting a subsidy on the sale of fertilisers in all areas. While in areas of heavy consumption the maintenance of price in itself (at the present level) can act as sufficient incentive, in areas where the use has yet to catch up, a small subsidy is perhaps necessary till such time these come upto the level of other regions.

(c) Extension Programme

5.17 The message of any new method, practice or material in agriculture needs to be effectively conveyed to the cultivators. All the necessary resources both physical and otherwise may be there but unless these are properly conveyed, there is not much of a chance in enlarging the scale of adoption of a new method or material under our village conditions. The countryside is so vast and the villages are located in all nooks and corners that communication of knowledge to people, the majority of whom are illiterate, necessitates a suitable agency to perform this job and proper equipping it with the necessary tools, techniques and methods. With the advent of the community development programme in the early fifties, a country-wide National Extension Service has come into being. This is the extension agency located at the unit known as Block, which is charged with the responsibility of educating the farmers on the improved practices of agriculture.

5.18 Application of chemical fertiliser in the country began some time during the late forties but on a limited scale. It is only with the advent of planning that the role of this improved input in increasing crop yields was recognised. The National Extension Agency is in no small way responsible for the spread of fertiliser use in vast parts of the country. The V.L.W., the Agricultural Extension Officer and for that matter the block agency as a whole have played their part in taking the message of modern agriculture to a large number of cultivators. But a large ground is yet to be covered and the tempo has to be maintained in the ground already covered. The Block extension agency has to play the key role in this vital programme. So far as extending the use of fertiliser is concerned there is no othr promotional organisation excepting a few manufacturing firms, here and there, doing a little bit of extension work. A more systematic private effort is undertaken by the FACT in Kerala, which besides manufacturing its own fertiliser mixture grades, also has been doing effective extension work (including conducting soil tests for cultivators) over the last decade. But FACT is in a very advantageous position in as much as it has been vested with the monopoly distribution rights of nitrogenous fertilisers in that State. This is not so in the case of many other mixing firms in the other parts of the country. However, it has to be recognised that private manufacturing firms also can strengthen the efforts of the Block extension agency's work by properly coordinating their activities.

5.19 In this section the level of extension effort seen in our selected districts, the methods adopted and the relative effectiveness of these, the programme of conducting fertiliser trials and its impact and the effectiveness of the demonstration programme—are examined in some detail. In Table No. 5.5 (Appendix) the use of different extension methods in our sample areas is analysed. As may be seen from this, there are as many as 13 different methods reported in these areas. Among these by far the most important method employed both by the Block agency as well as the private agency is 'Demonstrations'. Personal contacts, group discussions and meetings, leaders' training camps and audio-visual methods also are employed in a good number of blocks. There cannot be any rigid approach in regard to adoption of a particular extension-method; perhaps it is necessary in the same area to have a combination of several of these as no single method can give the maximum result. But in agriculture, the value of 'demonstrations' (and the saying 'seeing is believing' is so true in our conditions) cannot be minimised for a programme like fertiliser where the results are easily demonstrable.

The details regarding the programme of demonstrations are discussed in a later section.

5.20 Any new practice in agriculture before being advocated for large scale adoption has to undergo two important stages. The first is the trial stage and the second one is the demonstration stage. Trials are generally conducted initially in the research stations to arrive at certain conclusions and then are also conducted on cultivators' fields to study the response under different agro-climatic conditions. It is only after obtaining satisfactory results through such trials the programme is recommended for general adoption and demonstrations occupy one of the most effective methods of spreading the method among large areas.

5.21 Simple fertiliser trials are being conducted for quite some years in the States of Madras, Kerala, Andhra Pradesh, Mysore, Madhya Pradesh, Uttar Pradesh. Punjab, Rajasthan, West Bengal and Himachal Pradesh. In addition to such simple fertiliser trials, Punjab and Himachal Pradesh are conducting experiments under other schemes also. In Bihar, under the field experimental service, experiments are being conducted. In the States of Gujarat, Maharashtra, Assam and Orissa, no trials of any of these types are conducted at the cultivators' level. Attempts were made to collect data from the State Governments on the coverage etc. of such trials in each State. Data were not available in most cases. However, in Madras, it was reported that 10 districts had been covered by such trials till 1963-64. Rajasthan and Himachal Pradesh had covered four and three districts respectively till the above year. Regarding the maintenance of records on such trials, it was reported that in 7 States separate records were kept for trials and demonstrations while the correct procedure could not be known in the States of Punjab, Madhya Pradesh and Uttar Pradesh.

(d) Demonstrations

5.22 Demonstration on cultivators' fields is considered to be one of the most effective extension methods in all the States. In the case of fertilisers, the results of the application of different types, doses under different soil, irrigation and cropping patterns are demonstrated to the cultivators to convince them of the utility of these. There is no definite policy indicated in regard to the type and number of demonstrations to be laid over a particular period. In most of the States, each year instructions are issued to the implementing authorities as to the number of demonstrations that are to be laid for different crops. The tendency, however, of late has been to fix as high a target as possible for a year, without much consideration to the feasibility of conducting successful demonstrations. Only in a few States such as Bihar, Uttar Pradesh and Andhra Pradesh, research requirements as well as the practicability from the angle of efficient performance are given due weightage in fixing the number of demonstrations. In Bihar, it is also reported that inspecting officers have instructions to find out the failures in order to remedy the defects. As regards the size of a demonstration plot in most of the States it is about 10 cents. In Mysore and Punjab still smaller plots are chosen for commercial crops and hilly areas. In Madras State, the size of the plot is about 20 cents. It is not very realistic to suggest any standard size for a demonstration plot. However, for the demonstration to be effective the plot should be nearer the average size of a holding (under irrigated and unirrigated conditions separately) in a village if this has to convey proper lessons and results to the cultivators. For fertiliser demonstrations a minimum of one acre should be deemed essential.

5.23 There are numerous types of demonstrations programmed in each year in all the States. There are the Centrally-sponsored free fertiliser demonstrations covering all the States. Besides, under the various special schemes for the development of crops such as Jute, cotton, groundnut and sugarcane demonstrations are laid. Since the advent of commounity development, the Block Extension Agency has its own programme of demonstrations. After the advent of package programme composite demonstrations have replaced the earlier type of pure result demonstrations. Thus, there are a variety of demonstrations that are being conducted all round the year on cultivators' fields. But the crux of the problem in recent years is that at the level of the State, district and Block there is no coordinated plan worked out for laying out the types and number of demonstrations on the field. Particularly at the block and village level, the same extension staff viz. the A.E.O. and V.L.W. have to attend to the numerous specialist programmes coming from the specialist officers of the higher level. This has adversely affected the quality of the demonstration and many times it amounts to mere doling out a certain quantity of fertiliser free of cost to a cultivator and calling his plot a demonstration plot. It is really difficult for the Block Extension Staff to supervise a large number of demonstration plots and probably this is the weakest aspect of this programme. It is of utmost importance to exercise considerable care in drawing up the number of demonstrations so as to make them amenable for maintenance of specified technical standards and thorough supervision. It is only in package districts that well thought out plan of demonstrations has come into being in the shape of composite demonstrations.

5.24 Since the demonstration implies a certain amount of risk to the cultivator who agrees to have this in his field, certain facilities are offered by way of free seeds, fertilisers, P.P. materials etc. This is prevalent in almost all the districts of our study, although the nature and extent of such facilities vary from State to State. In some districts, a cash subsidy is also given in lieu of the additional costs to be incurred for labour etc. Such subsidy varies from Rs. 20/- per demonstration in West Godavari district of Andhra Pradesh to Rs. 120/- in Thanjavur district of Madras State. However, free supply of improved seeds, implements and fertilisers are the most commonly noticed facilities in these areas. But, it would be necessary firstly to strictly enforce all the technical standards while laying out the demonstration and secondly, to choose different cultivators for different types of demonstrations in the season and also as between seasons. A tendency has been observed that because of the free supply of seeds etc., som of the more vocal persons offer themselves for laying demonstrations and the extension staff also would like to minimise their efforts of finding out new persons every time. Taking into account the basic needs of a good demonstration such as location of the plot on the road-side, typical conditions of soil, irrigation etc., the cultivator chosen each time need not necessarily be the one belonging to the progressive group. In fact, the stress in this should be on the less progressives who need to be convinced about the utility of a new method or practice.

5.25 To the cultivator who lays the demonstration on his field, suitable technical guidance should be available throughout the season and particularly when major agricultural operations are done. At present, almost the entire burden of offering such guidance seems to fall on the V.L.W. He works under the guidance of the Agricultural Extension Officer who is the specialists in the field. The V.L.W. is expected to perform a variety of technical jobs right from choosing the cultivator upto the harvesting of the crop in the plot. The most crucial aspect in a successful demonstration is to really demonstrate the results of a particular practice followed to as large a number of cultivators as possible at the various stages of crop growth and at the time of harvesting the crop. The effectiveness with which he is able to perform all these jobs depends in a large measure on the number of places he is to physically be present, technical competence apart.

5.26 How far the V.L.W. is able to discharge his functions in this regard should be a matter of concern to the authorities interested in the successful implementation of agricultural production programmes. Our field observations show that there is a big gap between what the V.L.W. is expected to do and what he has been actually doing. Field reports from Uttar Pradesh, Bihar and Rajasthan revealed that the V.L.W. was usually not present when the demonstration was laid. In one of the blocks of Madhya Pradesh, it was reported that result demonstrations were laid by the V.L.W. on the same cultivator's fields year after year. Thus, this programme is treated as a very routin matter. In many cases the villagers were not even aware as to the location of demonstration plots in their villages. In the selected blocks of Goalpara district (Assam), demonstrations amounted to mere distribution of free fertilisers to some favoured cultivators. The authorities concerned in the South Arcot district of Madras State admitted that because of too many and too very scattered nature of these over large areas the V.L.W's were not able to offer adequate technical guidance. However, we have some favourable account from States such as Mysore, Andhra Pradesh, Kerala, Maharashtra, Gujarat, Punjab and Himachal Pradesh, where the V.L.Ws. are stated to be taking sufficient interest in the proper laying out of the demonstrations. In the Hissar district of Punjab, it was reported that the V.L.Ws. themselves undertook inter-cultural operations such as weeding in the demonstration plots. The role of A.E.O. in demonstrations was considered practically nil in 35 out of the 38 selected districts of study. The remaining three districts where it was considered adequate happen to be the package districts. The supervision from the higher level officers is considered very infrequent and this was said to be the reason was for the indifference of the A.E.Os.

5.27 Laying a demonstration and seeing through all the details upto the stage of harvest amounts only to half the job intended. Equal if not greater importance is attached to the follow-up of such demonstrations. In regard to the follow-up programme, our field observations showed that there were no systematic efforts in many areas. Theoretically, instructions to the effect that the results of the demonstrations are to be widely publicised, exist in most of the States. But, there is no clearcut policy in the recording, maintenance and propagation of the results of this programme. A proforma is devised for recording of data relating to the cost of inputs and value of output, only for the Centrally-sponsored free fertiliser demonstrations. But, for the other types of demonstrations no such record was maintained in any of the districts of our study. Only results sheets are maintained in some of the States and copies of these are simply forwarded to the district and State level authorities. It is only in Kerala, Madras and Madhya Pradesh, it was reported that some efforts were made to analyse the data and publish the results in the form of brochure. In Kerala, it was also reported that the results of the demonstrations were publicised through press, radio and through the department. In Punjab, the comparative advantages were reported to have been shown through charts etc. to cultivators. There are no such specific instances in the other States.

5.28 At the Block level, information was collected as to what measures were taken to propagate the results of demonstrations. The following statement shows the various measures reported in the selected blocks :

Measures reportedly taken to publicise the demonstrations.	No. of Blocks reporting.	Of this, No. covered by package programme.
1	2	3
1. Laying of demonstrations on roadside/commonly visited place	10	4
2. Fixing of boards or placards at the site	9	4
3. Educational Tours (Intra-Block and Inter-Block)	6	2
4. Inviting and collecting of farmers at the demonstration plots to witness the difference	37	15
5. Publicity in staff meeting	5	4
6. Publicity in melas/training camps	4	2
7. Persuation through individual contacts	5	3
8. Persuation through group discussions	10	4
9. Exhibition of charts, photographs, in panchayat-ghars, etc.	6	2
10. Separate harvesting and threshing in the presence of the neighbouring farmers	18	5

Thus, demonstrating the measures to group of cultivators, separate harvesting and threshing in the presence of groups of farmers, laying demonstrations on the road-side and group discussions were reported by larger number of blocks.

5.29 Regarding the effectiveness of the demonstrations a little over 50% of the selected blocks reported in the affirmative as evidenced by the increased consumption of fertilisers in these areas. There is no doubt that this extension method has proved quite effective in the promotion of fertiliser use particularly for irrigated crops. For unirrigated crops, the cultivators are not very receptive to use these although the department recommends fertilisers in smaller doses. The stress from now onwards on laying demonstrations should be more on such crops. The blocks reporting ineffectiveness of demonstrations attributed it to reasons such as, improper organisation of demonstrations being limited to the favourite and influential cultivators (Azamgarh and Cooch-Behar), instructions not being followed strictly by cultivators (Cuttack, Cachar and Trichur) and V.L.Ws. not competent enough to convey all the technical details (Cuttack and Burdwan). From the foregoing analysis emerge the following conclusions of a general nature :

(1) In planning of demonstrations there is not much of coordination at present as between the normal departmental officials and the officers dealing with the various special schemes. This aspect needs thorough examination at different levels so as to minimise the work-load on the field extension staff such as A.E.O. and V.L.W. and also to ensuring certain technical standards in laying out these.

(2) The performance both in planning and implementation is better in the package districts and it is worthwhile considering the laying out of 'composite type' of demonstrations followed in these areas.

(3) Unless the number and types of demonstrations are reduced to a manageable size for a block, effective supervision and follow-up cannot be ensured. In this context, it may have to be examined whether agricultural officers above the V.L.W. should have some direct responsibility in supervising certain number of demonstrations besides exercising over-all supervision on a sample basis in their jurisdiction.

(4) Certain facilities and concessions by way of free supply of materials etc. are in vogue in most areas. This is necessary particularly when a new type of fertiliser is introduced but while choosing cultivator beneficiaries under this programme, care should be taken to select fresh persons in the same village during each season.

(5) For the general type of demonstrations conducted through the block funds, special schemes etc., there are no proper records maintained for collection of data on results. Simple proforma should be designed and prescribed wherever it is not in vogue now. This should not result in too much of writing work to the V.L.W. but if item No. (1) above is adopted there should not be too much of such work accruing on this account.

(6) The results of the demonstrations are being publicised in a variety of ways in most areas. There is need for systematising this aspect, as effective propagation of results alone can prove rewarding to this programme. Proper care in the selection of the plot, cultivator and the close supervision and guidance offered in the course of a demonstration, determine the success of demonstrations.

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CHAPTER VI

KNOWLEDGE, USE AND PREFERENCE OF CULTIVATORS

(1) Introduction and Background Information

6.1 This Chapter analyses the extent of knowledge and use of chemical fertilisers, compost and other local manures by selected respondents. It also examines the knowledge of recommended chemical fertilisers in terms of N.P.K. and grades and dozes (applied) for different crops in irrigated and unirrigated areas of package and non-package districts. Respondents preference for individual items in 'N' group as well as the reasons for not covering the entire cropped area, are also analysed.

6.2 It may be pointed out that the package districts are in a more advantageous position in regard to irrigation, supply of improved agricultural inputs, supply points, strength of extension staff etc. Naturally, it would be of some interest to compare the growth of fertiliser used in the package and non-package districts by the three distinct groups of owner cultivators, tenant cultivators and others. However, due to obvious limitations, this analysis is restricted to four crops (paddy, wheat, sugarcane and groundnut) and the chemical fertilisers are dealt with in terms of N.P.K and Grades.

6.3 Before the growth of fertiliser use, knowledge about dozes etc. are considered, it would be useful to have an idea of the land holding position, land use pattern etc. of the selected respondents. Appendix Table 6:1 discloses the Statewise land holding position of selected respondents in package and non-package districts. It has been observed that cultivators in the package districts of Punjab had the highest average leased in holding of about 2.4 hectares, followed by Kerala. In non-package districts, Mysore and Kerala had the largest number of cultivators with leased in land.

6.4 It may be observed that respondents in non-package districts had larger cultivated holding than those in package districts; on an average, the selected respondents in package districts had 2.9 hectares of cultivated holding while those in non-package districts had 3.3 hectares. Cultivators in Rajasthan and Punjab had the largest average size of holdings in package district while Gujarat and Punjab had this privilege in non-package districts.

6.5 *Land use pattern of selected respondents*: Appendix Table 6.2 presents the State-wise details of land use for four years (1959-60 to 1962-63). It may be observed that there was no appreciable degree of elasticity in the gross cropped area between the two points of time in both types of districts. In non-package districts the percentage of net cropped area irrigated did, however, show slight upward trend. The annual addition to the net irrigated area was of the order of about 1% while this remained almost constant at 64% in the package districts. Slight improvement has been noticed in the gross cropped area of the package districts of Punjab and Andhra and in non-package districts of Assam, Gujarat, Rajasthan and Punjab; in other States, this change was extremely marginal. Net sown area increased by about 14% between the two points of time in the package districts of Punjab. In the case of non-package districts Punjab, Mysore, Assam, Madhya Pradesh and Rajasthan had indicated some extension in net sown area.

6.6 *Pattern of cropping of selected respondents* : Appendix Table 6.3 indicates the pattern of cropping adopted by the selected respondents for the four important crops in both types of districts during 1962-63. It has been noticed that 77% of the respondents in package districts and 64% in non-package districts had grown paddy on whole or part of their holdings. In package districts, the paddy growers raised this crop on about 42% of the gross cropped area, of which about 74% was irrigated. These proportions in non-package districts were rather low; 22.4% and 51% respectively. The bulk of the respondents in the package districts of Andhra, Assam, Bihar, Jammu & Kashmir, Madras, Maharashtra, Orissa, West Bengal, M.P., Mysore, Gujarat and Kerala, were paddy growers. This was so in the case of non-package districts of Orissa, West Bengal, Madras, Andhra, Assam, Bihar, Himachal Pradesh, Kerala, Uttar Pradesh, Mysore and Maharshtra. In the remaining States, paddy does not figure as an important crop.

6.7 With regard to area under this crop, package districts of Assam, Orissa, Madras, Andhra, Jammu & Kashmir, Madhya Pradesh, Kerala and West Bengal reported proportionately high acreage. In non-package districts, Madras, West Bengal, Orissa and Assam had the distinction of having the highest proportion of gross cropped area of the respondents under paddy. Almost all the paddy area in the package districts of Andhra, Jammu & Kashmir, Madras, Mysore and Kerala, was irrigated.

6.8 The next important crop, wheat, had been sown by 27% of the respondents in package districts and 37% in non-package districts. The area under this crop formed 10.6% of the gross cropped area of those who raised this crop, in package districts and 9.7% in non-package districts. About 86% of the wheat area in the package and 67% in non-package districts were irrigated. In the package districts, States like Bihar, Punjab and Uttar Pradesh had the largest proportion of wheat growers among the respondents while in non-package districts, Himachal Pradesh, Punjab, Rajasthan and Uttar Pradesh had this distinction. In the package districts of Rajasthan, U.P. and Punjab, almost the entire wheat area and very high proportions in Bihar, was irrigated. This was so in the case of non-package districts of Uttar Pradesh, Punjab and Rajasthan also.

6.9 In the package districts, 18.3% of the respondents and in non-package districts 16.8% raised sugarcane crop during 1962-63. The acreage under this crop formed about 2.3% of the gross cropped area of the cane growers in both types of districts, of which 96% in package districts and 88% in non-package districts have been irrigated. In the package districts, Punjab and in non-package districts, Uttar Pradesh had the largest proportion of cane growers among the respondents.

6.10 Groundnut has been raised by 8.4% of the respondents in package districts and 13.4% in non-package districts. About 3% of the total cultivated area of those respondents in package districts and 8.5% in non-package districts, were covered by this crop in 1962-63. About 13% of the groundnut area in the package districts have been irrigated while it was only 6.3% in non-package districts. The intensive development areas of Punjab, Gujarat, Mysore, Madras and Orissa had the largest proportion of respondents growing this crop. In the case of non-intensive districts, this was so in the case of Gujarat and Andhra. With regard to area under this crop in the package districts, about 13.2% of the gross cropped area in Punjab and 10.2% in Gujarat were covered by groundnut. In the non-package districts groundnut accounted for 48% of the gross cropped area in Gujarat.

(II) Knowledge and use of fertilisers

6.11 In this section, the progress of acquisition of knowlede and use of fertilisers by selected respondents is analysed. On the whole, about 89.5% of the sample respondents in the package districts and 86.1% in the non-package districts had acquired knowledge of chemical fertilisers upto the end of 1962-63. Of them, 68.3% in package areas and 49.8% in non package areas had used some type of chemical fertiliser upto that point of time. The following table indicates the proportion of respondents who had gained knowledge and the proportion of the knowledgeable persons using during the five points of time :—

TABLE 6.1

Classification of respondents according to knowledge and use of one or more fertilisers over a period of time in package/non-package districts

Period	Package Districts			Non-package Districts		
	No. of respondents with knowledge upto 1962-63.	% knowing during the period	% using of Col. 3	No. of respondents with knowledge upto 1962-63.	% knowing during the period	% using of Col. 6.
1	2	3	4	5	6	7
1950-51 & Before . .	1297	18·7	67·0	1979	6·9	56·9
1955-56 . .	,,	38·1	60·8	,,	26·8	42·6
1960-61 . .	,,	91·5	62·3	,,	90·6	48·9
1961-62 . .	,,	97·9	70·3	,,	96·6	53·5
1962-63 . .	,,	99·9	76·4	,,	99·2	58·2

Of the 1297 main sample respondents who had acquired knowledge of chemical fertilisers in the intensive areas upto 1962-63, only about 19% knew of one or more type of chemical fertilisers, upto the end of 1950-51 and only 67% of them had used some type or the other. In non-package districts, these accounted for about 7% and 57% respectively. Thus, knowledge as well as use of chemical fertiliser was meagre at the commencement of reference period. Since then, the progress of acquiring knowledge and use gained momentum. By the end of 1962-63 almost all the respondents were aware of one type or the other of chemical fertiliser although only 76.4% had used it some time in the package districts.

6.12 Not much of variation in the pattern of acquisition of knowledge has been noticed in the non-package districts also except in the initial year of the reference period. By 1962-63, the proportion of those who were aware of chemical fertilisers in these districts almost levelled up with that in the package districts. But, the proportion of those using was less by 18.2% compared to package areas. Eventually, more cultivator households with knowledge from the intensive development areas adopted chemical fertilisers or at least tried one or more types.

6.13 The progress of acquiring knowledge as well as use by respondents in different States is presented in Appendix Table No. 6.4. In the package districts of States such as, Andhra Pradesh, Bihar, Jammu & Kashmir, Madras, Mysore and Punjab, more than 90% of the respondents who knew about any chemical fertiliser, had used some type at some point of time upto 1962-63. This was also high in all the other States except Orissa and Rajasthan. In non-package districts, in no State, it was more than 85%; the highest proportion of users hailed from Gujarat, Andhra, Madras, Orissa, Uttar Pradesh and Himachal Pradesh in that order. In three States viz. Gujarat, Orissa and Rajasthan, the larger proportion of those with knowledge in the non-package districts had used chemical fertiliser than in package districts.

6.14 The level of knowledge attained and use of chemical fertilisers by three different categories of respondents (owners, tenants and others), may be seen from the following table :—

TABLE 6.2

Distribution of repondents according to knowledge and use of fertilisers in package and non-package districts, by categories upto the end of 1962-63.

Type of respondents	Package		Non-package	
	% knowing	% using	% knowing	% using
1	2	3	4	5
Owers	99·9	78·5	99·3	60·6
Tenants	100·0	82·5	99·5	47·1
Others	100·0	45·6	97·7	38·0

Between the two types of districts, proportionately larger number of respondents in each category had used chemical fertilisers during 1962-63 in the intensive development areas than in the non-package districts; this is more pronounced in the case of tenants. By the end of 1962-63, proportionately more tenant cultivators in the package districts had used chemical fertilisers than the owners. In this respect, those in the category of 'others' lag very much behind the other two. In non-package districts, however, the owner cultivators were ahead of both the other categories; the proportion of users among them exceed the 'tenants' by 13.5% and 'others' by 22.1%.

6.15 Appendix Table 6.5 gives the progress of acquisition of knowledge and use by categories of respondents during different periods of time upto the end of 1962-63. It has been indicated that upto the end of agricultural year 1950-51 though higher proportions of owner cultivators with knowledge had gone in for chemical fertilisers, the proportion of those who had acquired knowledge did not exceed 20% in package districts and 7% in non-package districts. More or less the same trend has been noticed for other two categories of respondents also in both the types of districts. However, the tenant group in the non-package districts indicated lesser proportion of users in 1955-56 than in 1950-51 and the same trend continued upto 1962-63 when it more or less levelled up. This may presumably be due to the faster tempo of acquisition of knowledge as in the initial year it was more of spreading knowledge unaccompanied by the necessary resources to procure these items.

6.16 *Use of N.P.K. and Grades*: So far, we have been reviewing the acquisition of knowledge and progress of use of chemical fertiliser in general during the reference period upto the end of 1962-63. Data on this acquisition of knowledge and use of the main components of the fertiliser programme i.e. N.P.K. and Grades are also available. At this stage, it may be observed that the use of potassic fertiliser is very scanty in most of the areas and hence it is not covered. Therefore, in Appendix Table 6.6 the acquisition of knowledge and the progress achieved in the use of only N.P. and Grades by those who are aware of the fertiliser programme in the two types of districts in different States, are presented. The following is the summary of that table for the latest year i.e. 1962-63 :

TABLE 6.3

Proportion of Respondents knowing and using S.P. & Grade by the end of 1962-63.

Type of Fertilisers	Package			Non-package		
	No. of respondents	% knowing	% using	No. of respondents.	% knowing	% using
1	2	3	4	5	6	7
N . . .	1297	98·9	72·9	1979	97·2	51·3
P . . .	1297	74·8	44·9	1979	57·9	40·4
Grades . .	1297	28·9	62·4	1979	19·9	56·1

6.17 Nearly, all the respondents in both the package and non-package districts were informed of nitrogenous fertiliser by the end of the reference period. In the non-package districts, only in three States viz. Bihar, Mysore and Punjab, all the respondents who knew about chemical fertilisers were also aware of the 'N' group but this awareness was equally high in other States also except in West Bengal and Gujarat. In the package districts, about three-fourths of those who had acquired knowledge and in non-package districts about half of them had used some type of 'N' fertiliser upto the end of 1962-63. This was very high in the intensive development areas of Andhra, J & K, Punjab, Madras, Bihar and Mysore while it was fairly high in States like Kerala, U.P., West Bengal and Maharashtra. In non-package districts, more than 70% of the knowledgeable persons in Andhra and Orissa and more than half of them in Bihar, Madras, Punjab, Rajasthan, Uttar Pradesh and Himachal Pradesh had used it. Eventually, in almost all the States, respondents in package districts had gone in for 'N' fertilisers in large numbers except in Orissa and Rajasthan than in non-package areas. In Rajasthan and Orissa, the number of those using 'N' fertiliser in the non-package districts was, however, higher than those in the package districts.

6.18 Appendix Table 6.6 also brings out the progress of attaining knowledge and adoption over a period of time. In the initial year i.e. before 1950-51, the knowledge of 'N' fertiliser was very limited both in package and non-package districts but by 1960-61 almost all respondents in Andhra, Bihar, J & K, Kerala and West Bengal knew about it in package districts. During the same period, a large majority of them in Andhra, Jammu & Kashmir, Bihar and Punjab had also used it; in Rajasthan, however, in spite of awareness on the part of about 80% of those who had acquired knowledge only 7.4% used it in package districts. In non-package districts during the same period, the extent of awareness of 'N' type of fertiliser was more than 90% in Andhra, Bihar, Kerala, Madras, Maharashtra, Mysore, Orissa, Punjab and Himachal Pradesh. With regard to users among them, Orissa had the highest proportion followed by Uttar Pradesh, Andhra and Madras. The lowest proportion of users, however, was reported from the non-package districts of Gujarat and West Bengal. By the end of 1960-61, about 91% of the respondents in package districts had acquired knowledge and of them 60% had adopted compared to 88% and 43% in non-package areas.

6.19 The acquisition of knowledge and the use by different categories of respondents may be seen at Appendix Table 6.7. In the initial stages, the knowledge of 'N' type of fertiliser was very marginal among all the three groups in both types of districts. However, between the two types of districts, respondents in each category in the package areas were better informed than those in non-package districts. By 1960-61, the difference in the level of awareness between the different categories of respondents as well as the two types of districts, had narrowed down. In the package areas, the owner cultivators who were aware of 'N' fertiliser exceeded the other two categories by about 9%. In the non-package areas, the tenants had an edge over the owners by about 4% and over 'others' by 8%. The proportion using among them in the same period disclosed very little difference between the owners and tenants in package districts whereas in the non-package districts, it was about 16%. But, the category of 'others' in the package districts lagged very much behind whereas in non-package areas this difference between the tenants and others was hardly perceptible. In the case of non-package areas, the tenant cultivators had a marginal lead over 'owners' and 'others' in the acquisition of knowledge. In spite of all those in the group of 'others' being informed of 'N' fertiliser by 1962-63, only less than 50% of them had used it by then whereas about three-fourths of the other two categories had used it in the package districts. In the non-package districts, although 97% of those from the category of 'others' were aware of the programme, only half of them had used it upto the end of the reference period. It, thus, would appear that in the package districts, there was hardly any perceptible difference in the level of users between the tenants and owners. In the non-package districts, the owners had a lead of about 12% over tenants.

6.20 *Phosphatic Fertiliser* : Next to 'N' fertilisers, the most popular is the phosphatic group. By 1962-63, about three-fourths of those who had acquired knowledge about any chemical fertiliser in the package areas and about 58% in the non-package districts, were also aware of phosphates (see Table 6.3 above). By the same period, about less than half in the intensive areas and two-fifths in the non-package districts had used one type of phosphate or the other. However, it may be noted that this type of fertiliser caught the imagination of the cultivators in a sizeable degree only by 1960-61. Appendix Table 6.7 also indicates the State-wise variation between package and non-package districts in the level of knowledge as well as use of 'P' fertiliser over a period of time. It has been observed that in six States (Maharashtra, Mysore, Madhya Pradesh, Kerala, Andhra and Bihar) over 90% of those who had knowledge of any fertiliser, were aware of phosphates also in the package districts. Over three-fourths of the respondents in the non-package districts of Gujarat, Bihar, M.P., Andhra, Maharashtra and Orissa, knew about it. In the case of States like Punjab, Rajasthan, West Bengal, Uttar Pradesh and Himachal Pradesh, the proportion of respondents with knowledge of 'P' was less than 30%. Gujarat, Bihar and Mysore lead in the proportion of users during the same period in non-package districts. Between the two types of districts it has been observed that in Kerala and Maharashtra, larger proportion of knowledgeable respondents had used 'P' fertilisers in non-package districts than in package areas.

6.21 Among the three categories of respondents, though initially the group of 'others' had a slight lead over 'owners' and 'tenants' in awareness of 'P' fertiliser in package districts, the users among the group of 'owners' far out numbered both tenants and others. The awareness as well as adoption in both types of districts among all categories of respondents till the end of 1960-61 was very low. By this period, however, 'P' also became increasingly popular and in package districts 61% of owner cultivators, 40% of tenants and 54% of others were aware of it. The users among the owners were not commensurate with the level of awareness though they had a lead over the other two categories. In non-package districts also, more or less the same trend was discernable. By the end of 1962-63, over 78% of the owner cultivators in package districts and 59% in non-package districts were aware of 'P' and of them 47% and 42% respectively had used some type of 'P' fertiliser.

6.22 *Fertiliser Grades* : Compared to 'N' and 'P' fertilisers, Grades were also less known to the respondents in both types of districts. Even at the end of the reference period, awareness extended hardly to 29% in package districts and about 20% in non-package districts. Upto 1960-61, the proportion knowing fertiliser grades was extremely low. But by 1960-61, grades also began to catch up and during that period about 22% in package areas and 16% in non-package districts came to know of them. By that year, over half of those who were aware in package areas and 46% in non-package districts had used one type of grades or other. By 1962-63, the situation had further improved in both types of districts.

6.23 Appendix Table 6.6 indicates the level of knowledge attained and used by the respondents in different States over a period of time for Grades also. In the package districts, only in four States (Andhra, Bihar, Kerala and West Bengal) some sizeable proportion of knowledgeable respondents could be noticed whereas in the non-package districts this was so in Madras, Kerala, West Bengal, Mysore and Uttar Pradesh. None of the selected cultivators in the package districts of six States (J & K), M.P., Maharashtra, Orissa, Punjab and Rajasthan) and in the non-package districts of five States (Madhya Pradesh, Orissa, Punjab, Rajasthan and Himachal Pradesh) was aware of fertiliser grades. In the remaining States, this awareness was extremely limited.

6.24 Among the three categories of respondents, owner cultivators were the least informed of fertiliser grades upto the end of 1960-61 in package districts. During the same period, the users among them formed 60% while among the tenants and others it was about 39% and 36% respectively. In the non-package districts, about 18% of the group of others was informed of fertiliser grades while only 15% each of owners and tenants knew about it. By the end of 1962-63, proportionately more owner cultivators had gone in for fertiliser grades in both types of districts than the other two categories.

III. Crop-wise use of Fertilisers

6.25 *Users of different types of chemical fertilisers and manures in* 1962-63 *on four crops* : Some data on the use of different types of chemical fertilisers and manures for the four crops are also available. The following table indicates the position in 1962-63 in the two types of districts :—

TABLE 6.4

Proportion of users of different types of chemical fertilisers and manures in 1962-63 *on important crops.*

Crops	Type of district	Proportion using. *				
		Nitrogenous fertilisers.	Phosphatic fertilisers.	Fertilizer Grades	F.Y.M./ compost.	G. Manure
1	2	3	4	5	6	7
Paddy. . .	P	91·2	43·8	16·4	91·2	1·8
	NP	84·7	27·5	20·9	84·4	0·5
	Total	88·5	37·1	18·2	87·3	1·1
Wheat . .	P	97·0	20·7	6·5	97·4	—
	NP	73·5	26·4	9·0	95·7	1·7
	Total	87·2	23·1	7·5	95·9	1·5
Sugarcane . .	P	93·2	33·8	16·9	87·5	..
	NP	95·1	11·6	5·8	96·8	..
	Total	94·1	23·5	11·7	95·7	..
Groundnut . .	P	92·5	11·1	..	100·0	..
	NP	16·6	86·3	3·0	97·0	..
	Total	38·7	64·5	2·1	97·8	.

*Cols. 3, 4 and 5 as proportion to users of any chemical fertiliser and cols. 6 and 7 to users of any manure.

It may be pointed out that the users of different types of fertilisers and different types of manures are not mutually exclusive. It has been noticed that in the package districts, more than 90% of respondents applying any fertiliser to the four crops *viz.* paddy, wheat, sugarcane and groundnut, had treated their crop areas with 'N' type. In the non-package districts also large number of them had applied 'N' fertilisers to these crops except in the case of groundnut. Compare to the use of 'N', the users of phosphates and grades are proportionately very much low. With regard to the use of phosphates, about 44% of those who had applied any fertiliser to paddy in the package areas had used some types while in non-package districts it was low at about 27%. For sugarcane, this proportion in package districts was about 34% while in non-package districts it accounted for about 12% only. On the contrary, of the groundnut growers who had used any fertiliser in the non-package districts, 86% had used phosphates while this proportion in package districts was only 11%. As indicated earlier, grades did not figure to any appreciable extent in the use of fertilisers. Of the paddy growers using any fertiliser in the non-package districts, 21% had used fertiliser grades while in the package districts this proportion was less by about 5%. In the case of sugarcane, about 17% of the users of fertilisers applied grades to their crops in package districts while users in non-package districts were less by about 11% than in package districts.

6.26 F.Y.M./Compost has been widely used by the growers of these four crops in both types of districts. The least in this respect had been in the case of paddy growers in the non-package districts and the sugarcane growers in package districts, presumably because more and more cultivators had gone in for chemical fertilisers. The proportion using green manure to these four crops were extremely limited and, therefore, merits no comments.

6.27 *Use of fertilisers/manures exclusively or in combination on three important crops grown by the respondents* : Data on the exclusive use of fertilisers, in combination with manures and manures only, were collected for three important crops grown by the respondents. The persons for whom the particular crop is relevant have been decided on the basis of its economic importance to the cultivator. Cultivators apply on part of the crop area only fertilisers, both fertilisers and manures, manures only and no manure or fertiliser on certain other parts. Appendix Table 6.8 presents data according to the use of fertilisers on the four selected crops over a period of time in the package and non-package districts, while statewise details for 1962-63 are available in Appendix Table 6.9.

6.28 *Paddy* : Over the period, the proportion of those who had applied exclusively fertilisers on part of their irrigated paddy lands increased by about 6% in package districts, compared to 3% in non-package areas. The proportion of those using both fertilisers and manures was higher in the package districts than in the non-package districts, especially during the two latter years. But, those applying manures only on some of their crop area were larger in number in the non-package districts. A significant feature of this analysis is that the users of manures only in the package districts for irrigated paddy crop declined from 67% in 1959-60 to 45% in 1962-63. In the case of unirrigated paddy, users of chemical fertilisers exclusively as well as those using in combination with manures, were limited in both types of districts. It is also clear that the bulk of respondents applied manures on some of the areas under unirrigated paddy during all the four years in package districts while in the non-package areas, though manure use was quite high, paddy growers in unirrigated fields had not applied even manures.

6.29 Between the States large proportions of irrigated paddy growers in package districts of Andhra and Kerala had used only chemical fertilisers. In the non-package areas, the highest proportion of respondents using chemical fertilisers only had been from U.P. and Punjab (about 30%) while in Madras, it was only 17%. During 1962-63, on an average, 65% of respondents growing irrigated paddy in package areas applied both fertilisers and manures to some of their plots compared to about 40% in non-package districts. The highest proportion of those applying this combination belonged to the package districts of Madras, Mysore, Bihar and Andhra; it was also high in similar districts of Kerala, Jammu & Kashmir and Gujarat. In non-package districts, larger proportion of paddy growers reporting the use of this combination hailed from Andhra. In three other States *viz.* Punjab, Rajasthan and Himachal Pradesh, it was less than 6%.

6.30 The proportion of those who applied manures only on some of their irrigated paddy areas was the highest in package districts of Orissa, Madhya Pradesh, Maharashtra, Jammu & Kashmir, West Bengal and Uttar Pradesh. In non-package districts this was highest in Kerala, Orissa and Bihar; it was also high in Andhra, Madhva Pradesh and Mysore.

6.31 With regard to unirrigated paddy, only three States have reported that in package districts some areas had been treated with chemical fertilisers ouly and of them the highest proportion has been from Kerala where paddy is predominantly a rainfed crop. The application of chemical fertilisers only on unirrigated paddy in non-package areas has been mainly mentioned from Bihar and Himachal Pradesh. Among those who had applied both manures and fertilisers on some of their unirrigated paddy crops, large proportions were from the intensive development areas of Kerala, Maharashtra, Bihar and Gujarat; in the case of other States, it was less than 20%. In non-package districts, such use had been the highest in Kerala (23.6%) followed by Madhya Pradesh (12.8%). In Maharashtra, Orissa, M.P., Assam and Bihar, proportionately more respondents had unirrigated paddy areas treated with manures only in the package districts than in non-package areas.

6.32 *Wheat (Irrigated)*: In the package districts, the proportion of those who had used chemical fertilisers on wheat was larger than in the non-package areas. In 1959-60 about 23% of respondents in the package areas had applied chemical fertilisers only on some of their irrigated wheat plots. Over the period, the number of exclusive fertiliser users increased in both types of districts. The proportion of respondents using both fertilisers and manures on some of their plots under wheat was marginal in both types of districts. Though initially the number of users of manures only on wheat crop was also equal in both types of districts, by 1962-63, their number declined in package districts while in non-package areas the position remained more or less the same.

6.33 Among the wheat growing States, Bihar had the largest proportion of respondents using fertilisers only, followed by Punjab in the package districts. In non-package districts, the highest proportions using fertilisers only were, in U.P. and Rajasthan. The proportion of respondents applying fertilisers with manures formed about 13% on an average in the package areas. This has been mainly reported from West Bengal, Punjab, Rajasthan and Uttar Pradesh. In the non-package districts, the maximum numbers applying this combination were from Gujarat, Uttar Pradesh and Rajasthan.

6.34 *Sugarcane* : The application of fertilisers only on sugarcane crop was not very popular in any type of districts. The proportion of those using only fertilisers in the non-package areas suffered a decline over the period of time while in package districts it increased by 4%. Larger number of respondents in package districts have shown preference for the combined application of fertilisers and manures while in the other type of districts, the preference appeared to be more for manures only. It would probably be true to say that non-package districts suffered more from the constrain of non-availability of fertilisers than package districts. Thus, for example, in 1962-63 when about 67% of the sugarcane growers treated some of their plots with chemical fertilisers and manures in package districts, the same accounted for about 33% only in non-package districts. In contrast, about two-thirds of respondents in the non-package districts treated their sugarcane plots with manures only while one out of seven did so in the package districts.

6.35 Among the States, the package districts of Andhra, Bihar and Uttar Pradesh had the largest number of respondents using only fertilisers for this crop. In the case of non-package areas, it was only in Mysore and proportion was high. The number of respondents applying both fertilisers and manures in the package districts was larger in West Bengal, Punjab, Mysore, Kerala, Gujarat and Bihar than in other States. In non-package areas Mysore again leads to others in this respect. The total number of respondents using manures only on their sugarcane crop was not large in the package districts of any of the States but in the case of non-package areas high proportions were from Punjab, Rajasthan, Uttar Pradesh and Andhra Pradesh.

6.36 *Groundnut* : In 1959-60, about 40% of the respondents growing groundnut had applied chemical fertilisers only in the package areas while in other areas their proportion was negligible. By 1961-62, more than half the respondents used fertilisers exclusively in package districts while in non-package districts it had not even reached one-tenth of them. The combined use of both fertilisers and manures did not appear to be of importance in both types of districts during this period. As the crop being mainly unirrigated, exclusive application of manures seemed to be the dominant practice in both types of districts. From Appendix Table 6.9 it appears that larger number of respondents from the package district of Punjab used fertilisers only for this crop; this distinction in non-package districts goes to Madhya Pradesh. All those who had applied both manures and fertilisers hailed from the package districts of Gujarat while such use in non-package districts of Mysore, Andhra, Gujarat, Madhya Pradesh and Maharashtra was a little over one-tenth of the growers of this crop. It is also seen from the same table that the majority of manure users for this crop belonged to the intensive development districts of Gujarat and Orissa while the highest proportion of such users in the non-intensive areas was from Madhya Pradesh, Madras, Gujarat and Orissa.

6.37 *Proportionate area treated with fertilisers and/or manures* : While the number knowing/using fertilisers and manures indicated so far is useful, an analysis of area treated with these inputs would also be significant. An attempt is made to present crop-wise area analysis for the same reference period as in the previous sections in Appendix Table 6.10. It has been observed that proportion of irrigated paddy area treated with only chemical fertilisers was almost constant around 10% in package areas and 8% in non-package areas throughout the period. Use of fertilisers exclusively for unirrigated paddy was not significant in both types of district. Larger proportions of irrigated area under paddy in both types of districts were treated with both fertilisers and manures during the same time. The area so treated under unirrigated paddy also registered an increase of about 4% in package districts while in the other type of districts it remained almost stationary.

6.38 In the package districts of Kerala and Andhra, irrigated paddy area was mainly treated with fertilisers only (see Appendix Table 6.11) while in the remaining States such area was not significant. In non-package districts of Rajasthan, Uttar Pradesh, Bihar and Punjab, though proportionately larger areas were treated only with fertilisers, such irrigated paddy area was very much limited. The use of both fertilisers and manures on irrigated paddy in intensive development areas was high in Bihar, Gujarat, Mysore, Madras and Kerala while this was so in the non-package districts of Andhra, Madras and Mysore. The entire unirrigated paddy area in non-package districts of Madras was so treated while in the remaining States it was insignificant.

6.39. This analysis shows that the larger proportions of area under irrigated wheat was either treated exclusively with fertilisers or with manures than with both. In the package districts, however, more area under this crop was covered with chemical fertilisers; it registered a definite improvement between 1959-60 and 1962-63. In the non-package districts also there was some marginal improvement during the same period. The area treated by manures only, however, declined by about 8% in the package districts while in the non-package areas it remained constant. The highest proportion of area under wheat treated with fertilisers only was in the package districts of Bihar and Punjab and the lowest in Rajasthan. The package districts of Punjab and Rajasthan showed proportionately larger areas treated with both fertilisers and manures while this was so in the non-package district of Gujarat. Significantly, in the package districts of Rajasthan, exclusively application of manures was as high as 85% of the area.

6.40 In both types of districts, exclusive application of fertilisers on sugarcane does not seem to be popular to the growers. Even in 1962-63, the area so treated covered about one-fourth of the sugarcane area in package districts and 10% in non-package districts. On the contrary, the area treated both with fertilisers and manures was quite high in both types of districts during all the four years. In the non-package districts, though some growth was registered in this respect, yet it was not so perceptible as in the package districts.

6.41 It is significant that larger area under groundnut crop was treated only with fertilisers in the intensive development areas. Proportionately, larger area was treated with manures only rather than with fertilisers or in combination in non-package districts. Between the States, nearly 80% of the area in the package districts under this crop had been treated with fertilisers only in Punjab. The combined use of fertilisers and manures was not significant in any of the States though considerable area had been treated with manures only in the non-package districts of Madras and Madhya Pradesh.

6.42 *Per hectare use of 'N' fertiliser :* The area under different crops treated with 'N' fertiliser and doses per hectare applied, are presented statewise for four years for four important crops in Appendix Table 6.12. The following is an abstract of the same:—

TABLE 6.5

Area under different crops treated with 'N' *fertilisers upto* 1962-63 *and the quantity per hectare applied in package and non-package districts*

Year	Type of Distt.	Paddy		Wheat		Sugarcane		Groundnut	
		Area treated	Dose per hectare	Area treated	Dose per hectare	Area treated	Dose per hectare	Area treated	Dose per hectare.
1	2	3	4	5	6	7	8	9	10
1959-60	P	656·4	16·3	107·3	24·7	38·5	108·3	51·9	19·9
	NP	300·2	23·8	42·5	13·2	78·1	35·8	4·5	11·5
1960-61	P	850·7	16·9	115·4	20·9	46·7	99·5	51·4	21·7
	NP	374·5	22·4	58·4	16·2	85·6	36·0	7·3	23·9
1961-62	P	1,003·8	19·2	173·7	22·0	53·9	102·5	63·4	26·5
	NP	438·1	26·3	69·5	17·1	84·0	34·8	11·6	53·4
1962-63	P	984·5	19·2	261·1	20·5	96·9	76·5	69·6	19·1
	NP	440·4	22·3	100·3	13·9	90·4	35·2	13·6	48·6

Between the two points of time about 50% more of paddy area have been treated with various types of 'N' fertilisers in package districts and 47% more in non-package districts. The doses applied per hectare in the package districts seemed to be lower than the same in non-package districts. Statewise it has been observed that in 1962-63 in package districts of Uttar Pradesh and West Bengal and in the non-package districts of Orissa and Uttar Pradesh, on an average, the paddy growers applied less than 10 Kgs. per hectare. Users in the package districts of Jammu & Kashmir, Orissa and Gujarat used more than 30 Kgs. of 'N' per hectare on paddy crops; Gujarat led with 49 Kgs. In non-package districts, the highest per hectare use was in Rajasthan.

6.43 During 1959-60, large dose of about 25 Kgs. of 'N' per hectare of wheat area was used in the package districts which later on came down to 21 Kgs. per hectare. In non-package areas, the doses applied were much less during the same period. However, this went up during the next two years but declined to 14 Kgs. in 1962-63. Evidently, there is no particular trend thrown up in the application of 'N' fertiliser to wheat crop. On the contrary, the availability appeared to be the main impetus in the use of higher doses. From the Appendix Table 6.12 it is clear that the respondents from the package districts of Bihar and Punjab applied the highest per hectare dose of 'N' while this was so in the non-package districts of Madhya Pradesh and Rajasthan.

6.44 Comparatively higher doses of 'N' fertilisers have been applied to the sugarcane crop during each of the four years in the intensive development areas than in the other type of districts. In the non-package areas, these doses remained almost constant at 35 Kgs. per hectare during all the four years, while between the two points of time it registered a fall in package areas from 108 Kgs. to 77 Kgs. The highest per hectare dose of 'N' to sugarcane was in Mysore and Andhra during 1962-63. In non-package districts, this was so in Mysore and Punjab.

6.45 In the case of groundnut also, it may be observed that the quantity applied per hectare in package districts was higher than in the non-package areas during the earlier years but later the position was reversed. During 1961-62, the quantity of 'N' per hectare used in non-package areas was more than double the quantity used by respondents in package areas and in 1962-63 it was more than 2.5 times.

6.46 The quantity of 'N' fertilisers used by the respondents when they commenced using it and the quantity used by them in 1962-63, may be seen from the following table :—

TABLE 6.6

The quantity of 'N' fertilisers used by respondents when first adopted and growth in the quantity used by them in 1962-63

Period	Package			Non-package		
	No.	Quantity at first use (Kgs).	% increase in 1962-63.	No.	Quantity at first use (Kgs).	% increase in 1962-63.
1	2	3	4	5	6	7
1950-51 or before . .	137	27,540·0	144·8	70	9,004·1	86·5
1951-52 to 1955-56 .	111	14,675·1	210·4	100	11,147·1	85·4
1956-57 to 1960-61 .	346	32,692·1	152·4	360	33,914·8	27·3

ıe increase in the use of 'N' fertilisers in package districts was to the .tent 145% in the case of the first group. Those who came to adopt :tween 1951-52 and 1955-56 used more than thrice the quanity in 1962- }. In the non-package areas, the number of adopters as well as the ıantity used has been low in the initial stages. However, there was some crease in the quantity used by them in 1962-63 (86%). As in the case of ıckage areas, the number of adopters of 'N' fertilisers during the third :riod was substantially higher in the non-package districts also. But, in '62-63, they used only 27% more of 'N' than the quantity used by them the commencement of their adoption. Thus, it would appear that the crease in the quantity used was not commensurate with the proportionate crease in the number of persons using during that period. Between the 'o types of districts, the growth in the use of 'N' fertilisers in the pack- :e districts was significantly high.

6.47 Variations in the use of 'N' fertilisers by different categories of spondents: Variations in the use of 'N' fertilisers in the two types of stricts by the three categories of respondents may be seen at Appendix ıble 6.13. The following table shows the proportionate increase in the ıanity of 'N' used by these categories during the three time periods :—

TABLE 6.7

Growth in the use of 'N' fertilisers by different categories of respondents adopting in different periods of time.

?eriod of 1st use.	Percentage increase in the quantity used in 1962-63					
	Package districts			Non-package districts		
	Owners	Tenants	Others	Owners	Tenants	Others
1	2	3	4	5	6	7
.. 1951-52 and before . .	135·9	432·1	212·7	111·7	(—)8·8	Nil
!. 1951-52 to 1955-56 . .	212·3	246·2	(—)76·2	79·1	245·3	170·7
}. 1956-57 to 1960-61 . .	153·7	62·8	318·9	27·9	44·8	(—)11·4

ʌners cultivations in both types of districts have used more of 'N' in '62-63 irrespective of the period at which they started adoption. In the se of tenant cultivators, those who started using in 1950-51 used about e times more in 1962-63 while there was a decline of about 9% in the se of their counterparts in non-package districts. Users from the cate- ry of 'others' who had initially applied 'N' fertilisers during the second riod in package areas reported about 76% less in 1962-63 while those non-package districts, increased the quantity by 171%. In the case of ıants, the maximum increase in the quantity used, had been by those who :tially adopted it during the first period in package districts and those in : second period in the non-package districts.

6.48 *Use of chemical fertilisers in combination with compost/FYM d/or green manures*: At the respondent level data were collected re- rding the use of (a) chemical fertilisers with compost/FYM, (b) chemi- l fertilisers with green manures, and (c) chemical fertilisers, compost/ ⁽M and green manures on different crops by them and the area so treated.

The following table is a summary of such use in both types of districts for three main crops; the State-wise details of which are available in Appendix Table 6.14.

TABLE 6.8

Distribution of respondents and area of different crops treated with different combinations of manures with chemical fertilisers.

Items	Paddy-Irrigated		Paddy-Unirrigated		Wheat		Sugarcane	
	Package.	Non-Package.	Package.	Non-package.	Package.	Non-package.	Package.	Non-package.
1	2	3	4	5	6	7	8	9
1. No. of relevant respondents . .	790	712	410	743	281	522	154	279
2. Crop area (Hectares) .	1,513 ·0	1,003 ·9	516 ·3	799 ·6	481 ·8	497 ·2	76 ·9	166 ·6
Use of fertilisers & compost/FYM % using . .	57 ·3	39 ·3	16 ·8	8 ·0	13 ·8	8 ·0	65 ·5	32 ·6
% area treated . .	65 ·1	58 ·0	18 ·7	7 ·0	15 ·5	8 ·6	59 ·4	50 ·2
4. Use of fertilisers & Green manures. % using	26 ·2	8 ·0	2 ·1	1 ·4	0 ·7	1 ·3	1 ·9	0 ·3
% Area treated . .	28 ·6	15 ·8	5 ·0	1 ·7	0 ·4	1 ·1	2 ·8	1 ·0
5. Use of fertilisers with Compost/FYM & Green manure % using . .	35 ·5	17 ·2	6 ·8	3 ·7	11 ·0	5 ·1	18 ·1	20 ·7
% Area treated . .	38 ·3	27 ·3	9 ·7	3 ·0	13 ·4	4 ·5	23 ·9	31 ·0

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The number of respondents and the area treated with different combinations are not mutually exclusive. Among the growers of irrigated paddy, 57% in package districts and 39% in non-package districts applied chemical fertilisers and compost/FYM to 65% and 58% respectively of their cropped area. About one-fourth of the growers of this crop in package districts applied chemical fertilisers and green manures on 29% of their cropped area. A little over one-third of the cultivators of irrigated paddy again in package districts applied the tripple combination of chemical fertilizers, compost/FYM and green manure on 38% of their cropped area. In non-package districts, this was, however, not so marked. Among the different patterns of fertilisers, it may be mentioned that the combination of chemical fertilisers with green manure appears to be less popular. Between the two types of districts, the non-package areas lagged very much behind the intensive development areas in the application of any one of those combinations both in respect of users and the areas covered.

6.49 The use of any of the three combinations was comparatively less popular among the unirrigated paddy growers in both types of districts presumably because any pattern of manuring with chemical fertilisers as one of the components, presupposed assured irrigation. In package districts, only 17% of the crop growers applied chemical fertilisers and compost/FYM on 19% of their unirrigated paddy while in non-package districts, these proportions accounted for 8% and 7% respectively. The use of double and tripple combination of fertilisers and manures was negligible in both types of districts in terms of users and area.

6.50 For irrigated wheat, the combined use of fertilisers and compost/FYM seemed to be more popular than the others. Treatment of wheat area with chemical fertilisers and green manure is practically non-existent in both types of districts, but the users as well as area under the combination of all the three items also seem to be attractive. On the whole, it can be stated that application of green manures with fertilisers have not made much headway for this crop.

6.51 A large bulk of sugarcane growers in package districts had treated about 60% of their cropped area with chemical fertilisers and compost/FYM during 1962-63. In non-package areas, this proportion formed only at one-third of the cane-growers and half of their area under this crop. Less than one-fifth of the sugarcane growers in package districts also reported to have used all the tripple combination. In this respect, non-package districts indicated a larger proportion of both users and area.

IV. Cultivators' preferences between organic manure and chemical fertilisers for their important crops.

6.52 In the household enquiry, the cultivators preferences between organic manure and chemical fertilisers for their important crops were also ascertained. The table below presents the preference indicated for four important crops.

TABLE 6.9

Distribution of respondents according to their preference between chemical fertilisers and organic manures.

Crop	Type of District.	Relevant respondents.	No. and proportion (to col. 3) of respondents preferring.		
			Chemical fertilisers	Organic manure	Both/ Can't specify
1	2	3	4	5	6
Paddy. (Irrigated)	P	792	3·6	74·4	22·0
	NP	785	8·7	77·2	14·1
Paddy. (unirrigated)	P	241	2·1	69·7	28·2
	NP	633	14·4	70·6	15·0
Wheat	P	329	2·4	93·9	3·7
	NP	592	12·2	87·0	0·7
Sugarcane	P	260	8·1	65·8	26·1
	NP	309	5·8	91·9	2·3
Groundnut (Unirrigated)	P	64	32·8	42·2	25·0
	NP	191	8·9	85·3	5·8

In the package districts, only a small fraction of growers of irrigated paddy desired to use exclusively chemical fertilisers for their crop while in non-package areas this proportion was more than double that of the package. A large bulk of them preferred organic manure in both types of districts and the remaining could not make up their minds to express a clear preference or mentioned both. Of those who preferred chemical fertilisers only for their irrigated paddy crops in package districts, the highest proportions were from J & K and Kerala. (see Appendix Table 6.15). In this respect, Bihar had the highest proportion followed by Mysore and Andhra in non-package districts. Almost all irrigated paddy growers in the package districts of Uttar Pradesh, Bihar, Madras, M.P. and Maharashtra have shown their preference for organic manure; this is also preferred by more than 50% in Mysore, Orissa and West Bengal. In the case of non-package districts, Rajasthan, Himachal Pradesh, Uttar Pradesh, Punjab, Orissa and Madhya Pradesh have shown preferences in a big way for organic manures. This proportion was, also high in similar districts of Andhra, Kerala, Mysore and Madras.

6.53 Only a very negligible number of unirrigated paddy growers in package districts had expressed a desire to use chemical fertilisers to their crop but this proportion was about 14% in non-package districts. The main concentrations of those who preferred this in the non-package areas were noticed in Bihar and Madhya Pradesh. On the other hand, 70% of the unirrigated paddy growers in both types of districts preferred organic manure.

6.54 As in the case of paddy, the bulk of wheat growers in both types of districts preferred to apply organic manure to their crops. Those who preferred exclusively chemical fertilisers were larger in proportion in the non-package areas than in the intensive development areas. Among those who preferred to apply organic manure to their wheat crops were high proportions from the package areas of Punjab, Bihar, Rajasthan and Uttar Pradesh and from the non-package areas of Punjab, Rajasthan, Uttar Pradesh and Himachal Pradesh.

6.55 Proportions of cane growers desiring to apply chemical fertilisers only constituted 8% in the intensive development areas and 6% in non-package districts while a large bulk of the cultivators of both areas preferred organic manure only. The preferences to use fertilisers only were expressed largely by respondents of the package districts of Uttar Pradesh and Kerala and from Mysore in the case of non-package areas. Almost all the growers in the package areas of Punjab and Uttar Pradesh preferred only organic manure. Similar preference was expressed by those from Andhra Pradesh, Uttar Pradesh, and Rajasthan in the case of non-package districts.

6.56 Proportionately, larger number of groundnut cultivators in the intensive development areas desired to use chemical fertilisers for their groundnut crop than those from the non-package districts. Consequently, the proportion desiring to use organic manure was lower in the package districts than in the non-package districts. Most of those who preferred chemical fertilisers for this crop in package areas hailed from Punjab while in non-package areas in no State their proportion was high. In both types of districts, respondents preferring organic manures exclusively were quite high in Andhra Pradesh, Gujarat, Maharashtra and Madhya Pradesh.

6.57 *Preference for various types of 'N' fertilisers* : Data were also collected regarding the different types of 'N' fertilisers preferred by those who had indicated a definite choice for 'N'. The following is an abstract for the cultivators preferences for four crops :

TABLE 6.10

Distribution of respondents according to their preferences for various types of 'N' fertilisers for important crops.

Crops	Type of Districts	No. preferring 'N' fertilisers.	Proportion (to col. 3) of respondents preferring by types.			
			A.S.	A.S.N.	C.A.N.	Urea
1	2	3	4	5	6	7
Paddy (Irrigated)	P	584	79·4	0·5	6·7	13·2
	NP	530	76·6	0·6	4·7	18·1
Paddy (Unirrigated)	P	88	93·2	4·5	Nil	2·3
	NP	320	89·1	0·9	5·3	4·7
Wheat	P	150	84·0	Nil	16·0	Nil
	NP	326	66·8	0·6	25·2	7·4
Sugarcane	P	153	90·9	Nil	5·2	2·6
	NP	149	44·3	2·0	29·5	24·2
Groundnut (Unirrigated)	P	24	83·3	Nil	12·5	4·2
	NP	22	72·7	4·5	4·6	18·2

The choice of the largest number of respondents is Ammonium Sulphate among the 'N' group for these crops in both types of the districts. The majority of those who preferred Ammonium Sulphate for irrigated paddy belonged to the package districts of Uttar Pradesh, Madhya Pradesh, Madras, Mysore, Bihar, Orissa and West Bengal (See Appendix Table 6.15). The highest proportion wishing to use Urea hailed from the package districts of Kerala and Madhya Pradesh. All respondents in the non-package districts of Rajasthan also desired to use Urea for their irrigated paddy crop.

6.58 A larger number of respondents from both types of the districts preferred Ammonium Sulphate for their unirrigated paddy crop than for irrigated paddy. The largest number of such preferences have been indicated from the package districts of Madhya Pradesh, Gujarat, Maharashtra, Orissa and West Bengal. In non-package areas, their proportion was also high in Mysore, Himachal Pradesh, West Bengal, Uttar Pradesh, Kerala, Madhya Pradesh, Bihar, Maharashtra and Orissa.

6.59 For irrigated wheat crop, the large majority of respondents preferring 'N' fertilisers in both types of districts desired to use Ammonium Sulphate. CAN was preferred by 16% of respondents in the package districts and by one-fourth of them in non-package districts. The largest proportion who wished to use Ammonium Sulphate for wheat were from the package districts of Uttar Pradesh, Bihar and West Bengal. In non-package districts, this was high in U.P. and Madhya Pradesh. The highest proportion of persons who preferred CAN for wheat hailed from both types of districts of Punjab.

6.60 Large bulk of those who preferred 'N' fertilisers wanted to use Ammonium Sulphate for their sugarcane crop in the package districts while this was less than half in non-package districts. Relatively smaller number in both types of districts desired to use CAN for this crop. In non-package areas, about 24% wished to use Urea also while this type was preferred by only a very negligible number in the intensive development areas. Preference of Ammonium Sulphate was mainly expressed by the cane growers of Bihar, Mysore, Uttar Pradesh, West Bengal and Punjab; in the case of non-package districts this was from Mysore and Uttar Pradesh.

6.61 *Reasons for respondents preferences for various types of 'N' fertilisers* : The household schedule also collected details about the reasons for the respondents preferences for various types of 'N' fertilisers also. Appendix Table 6.16 indicates the preferences in package and non-package areas and reasons for the same for important crops. The main reasons for three important crops are presented below :—

TABLE 6.11

Respondents preferences for different types of 'N' fertilisers and the reasons for it.

Particulars/ reasons	Irrigated-Paddy				Wheat			
	Ammonium Sulphate		Urea		Ammonium Sulphate		CAN	
	P	NP	P	NP	P	NP	P	NP
1	2	3	4	5	6	7	8	9
1. No. giving preferences .	476	298	70	84	100	97	80	43
2. % indicating crop growth	71·2	61·0	80·0	55·9	78·0	34·0	16·6	13·9
3. %indicating yield .	43·2	46·9	41·4	35·4	19·0	49·4	11·1	46·5

Particulars/reasons	Sugarcane					
	Ammonium Sulphate		Urea		CAN	
	P	NP	P	NP	P	NP
1	10	11	12	13	14	15
1. No. giving preferences . .	146	49	3	18	5	30
2. % indicating crop growth . .	75·3	57·1	66·6	55·5	20·0	13·3
3. % indicating yield . .	23·2	38·7		16·6	20·0	53·3

The above table indicates that for all the three crops, the majority of those who gave preferences mentioned two main reasons viz. (a) helpful to crop growth and (b) better yield, for all types of 'N' fertilisers. In the case of irrigated paddy, both in package and non-package areas, crop growth weighed with bulk of respondents preferring 'N' to go in for Ammonium Sulphate and Urea. Next in importance to this reason which prevailed upon those respondents to prefer Ammonium Sulphate, was yield. It has also been observed that in the case of unirrigated paddy also, the compelling forces for preferring Ammonium Sulphate as well as Urea in both types of districts, were the same.

6.62 The wheat growers also preferred Ammonium Sulphate mainly due to crop growth and yield in both types of districts. Besides Ammonium Sulphate, more growers desired to use CAN than Urea. However, the main reason which impelled this choice remained the same as for Ammonium Sulphate. Conviction in its efficacy and suitability to soil, availability of irrigation etc. also induced quite a few respondents to prefer CAN both in package and non-package districts.

6.63 Cane growers expressed their preferences mainly for three types of 'N' fertilisers—Ammonium Sulphate, Urea and CAN. As in the case of paddy and wheat, the bulk of the cane growers preferred Ammonium Sulphate as it helped crop growth and improved yield. Urea and CAN were preferred by relatively lesser numbers in both types of districts. Cane growers in non-package districts preferred CAN mainly because it helped better yield and also it suited their soil.

6.64 Application of Ammonium Sulphate to the groundnut was governed by similar consideration such as plant growth. Groundnut growers did not so much prefer other types of 'N'. Thus, by and large, most of the growers of paddy, wheat, sugarcane and groundnut, desired to use Ammonium Sulphate on their cropped area as it helped crop growth and better yield; only a limited number preferred Urea and CAN. In this context, it may be remembered that Ammonium Sulphate was the first 'N' type introduced all over the country. Unless the farmer is sufficiently educated about 'N' content of other different types and their correct doses for different crops, preference for a particular 'N' type becomes meaningless. This analysis only confirms that there is large deficiency in the technical knowledge among large number of cultivators on the adoption of these crucial inputs.

6.65 *Reasons for not applying fertilisers to all the areas under important crops*: The growers of various crops had not covered their entire cropped areas with fertilisers due to various reasons. Such reasons advanced by different categories of respondents may be seen at Appendix Table 6.17. The following, however, is the summary of the same for paddy, wheat and groundnut.

TABLE 6.12

Reasons for not applying chemical fertilisers to the remaining areas under paddy/wheat/groundnut in 1962-63.

Details/ Reasons	Paddy				Wheat		Groundnut	
	Irrigated		Unirrigated		Irrigated		Unirrigated	
	P	NP	P	NP	P	NP	P	NP
1	2	3	4	5	6	7	8	9
1. No. of respondents reporting part of area not fertilized .	126	108	130	409	107	335	18	104
2. % indicating supply difficulty . .	3·2	4·6	0·8	2·4	1·9	3·6	5·6	2·9
3. % indicating credit difficulty	30·9	40·7	17·7	44·3	60·7	34·6	11·1	27·9
4. % indicating soil difficiencies/lack of irrigation etc. . . .	23·1	22·2	12·3	19·3	9·3	40·3	22·2	26·9
5. % indicating reasons of convictions .	39·7	15·7	7·7	10·3	21·5	26·0	—	18.3

The main hindrance mentioned by paddy growers in package and non-package districts were lack of credit, unsuitability of soil, lack of irrigation and lack of conviction. The problem of credit being mentioned as a major limiting factor in package districts was somewhat revealing as better credit facilities were envisaged in such areas. About 2/5ths of such respondents in non-package districts had also mentioned this as a principal bottleneck in covering all area under both types of paddy. Unsuitability of the soil or lack of irrigation and other natural limitations had been mentioned as one of the reasons hampering the coverage of the entire irrigated paddy area. About 40% of the irrigated paddy growers in intensive development areas and 16% in the other areas did not use chemical fertilisers on their entire cropped area as they were not convinced of its superiority for improving crop growth or yield. This phenomenon revealed in the I.A.D.P. areas, inspite of better staffing and extending efforts, is disturbing. Various other reasons had also been mentioned by almost all the respondents who had some area unfertilised. They included reasons like others not doing so, lack of time, use of green leaves, sufficient compost/FYM applied, not interested, not supplied by the landlord, raised fodder crop, left fallow, etc. Since none of these constitute a major reason by itself, these are not analysed.

6.66 In package districts, proportionately more owner cultivators than the other two groups could not apply chemical fertilisers to their entire irrigated paddy area due to lack of credit. The proportion of owners mentioning this in non-package districts, is still higher. Another interesting reason given by all types of respondents from package districts was lack of conviction, in non-package areas, their proportion was relatively less. However, the number of such respondents lacking conviction was insignificant compared to those who had been using these materials among the respondent cultivators.

6.67 The main hindrance for covering the entire wheat area in package districts was credit while this had been mentioned by lesser number in non-package districts. Lack of irrigation facilities, soil deficiencies etc. were mentioned as limiting factors by larger proportions in non-package districts than the intensive development areas. Thus, as in the case of paddy, the most important reason for not covering the entire wheat area with chemical fertilisers was lack of credit facilities in both types of districts. Proportionately more respondents from each category in package districts had mentioned this than their counterparts in non-package areas. However, in the latter type of districts, larger number of respondents in each category had also mentioned the unsuitability of the soil/lack of irrigation, etc. as limiting factors than in package districts. But, in conviction, the owner cultivators in the intensive development areas were more or less at par with their counterparts in the other districts. Difficulties of supply were mentioned comparatively by lesser number of respondents.

6.68 Only a limited number of respondents had reported that they had not covered their entire sugarcane area with fertilisers. As in the case of paddy and wheat, the cultivators of cane also mentioned lack of credit as the main problem in covering the entire area. The next major reason reported was lack of conviction about the efficacy of chemical fertilisers to ensure better crop growth and yield.

6.69 Soil condition and lack of irrigation seemed to be the limiting factors for larger number of groundnut growers in both types of districts in covering their entire cropped areas; lack of credit was also mentioned by a few. Proportionately more respondents from the non-package areas had indicated both these reasons. Almost all those who had not covered their entire groundnut area with chemical fertilisers, were owner cultivators and being mostly a dry crop, the non-package areas claimed almost all of them.

6.70 *Knowledge of recommended doses*: In the household schedules, information on the knowledge of recommended doses of fertilisers for important crops was also collected. The following table shows this knowledge for the selected crops :—

TABLE 6.13

Respondents' knowledge of recommended doses for different crops.

Crops	Package		Non-package	
	No. of respondents.	No. with knowledge %	No. of respondents.	No. with knowledge %
1	2	3	4	5
Paddy (Irrigated) . . .	1,284	14·6	1,820	2·0
Wheat	539	7·1	1,130	0·7
Sugarcane . . .	274	3·6	411	0·2
Groundnut (Unirrigated) .	140	4·7	297	0·7

A large majority of the growers of the four crops in both types of districts did not know the recommended doses to be applied. It may be noticed that only 15% of the paddy cultivators in package areas and 2% in non-package districts had some knowledge about the correct dose. This had been mentioned by cultivators of paddy from package district of 8 States (Andhra, Bihar, Gujarat, J & K, Kerala, Madhya Pradesh, Maharashtra and Orissa). In the remaining States, the extent of this knowledge was very low. In the non-package districts, the proportion of the knowledgeable persons was extremely limited except, perhaps, in Andhra.

6.71 Among the wheat growers, 7% in the package districts had some idea about the recommended doses while in non-package districts this was less than 1%. This knowledge had been reported mainly from the package districts of Punjab and from the non-package districts of Madhya Pradesh. The proportion of cultivators with knowledge about doses to be applied to sugarcane crop was mainly reported from one State (Punjab) where about 1/10th of the cane growers knew about it. About 5% of the groundnut growers in package areas knew about the doses to be applied to the groundnut crop and almost all of them hailed from Punjab.

6.72 To sum up, a large bulk of respondent cultivators had very little idea of the recommended doses to be applied to their important crops which is indicative of probable indiscriminate use of such scarce inputs. This situation, if prevalent on a wider scale, should be a matter for serious concern to all those in charge of the programme.

CHAPTER VII

DEVELOPMENT OF LOCAL MANURIAL RESOURCES

7.1 A study of the use of fertilisers and manures will remain incomplete, in the Indian context, without an examination of the progress made and problems confronted in augmenting the production of local manurial resources. The Indian farmer knows the manurial value of items such as cow-dung, farm yard wastes, green manuring, oil cakes, tank silt and such other locally available materials. But for a variety of factors, he is either not able to conserve these on scientific lines or is not in a position to use them because of non-availability etc. Knowledge and use of chemical fertilisers is fast spreading particularly among irrigated tracts. The reception to this new type of inorganic fertilisers although is quite good, yet there is considerable number of farmers who are apprehensive in using them in heavy doses for fear of depletion of soil fertility. This apprehension is not devoid of practical experience in using these material. It has, however, to be recognised that fertiliser is not a substitute for the various types of local manures traditionally known and used by cultivators. On the other hand, they are complementary to each other, in so far as, use of organic manure helps soil build up, better moisture retention, and also facilitates increased use of inorganic manures. Thus, there is need to develop local manurial resources in a planned manner instead of leaving it to the good sense and discretion of individual cultivators.

7.2 In this Chapter, the state of development of local manures and farm wastes and extension of their use in different parts of the country are discussed. The narration in the following paragraphs is confined to three principal types of such manures viz. (1) Compost (2) Green manures, and (3) Other local manures such as night-soil, tank silt etc.

1. Compost

7.3 Generally, compost has come to be known as that part of farm yard manure which is better preserved and de-composed. In some States such as Madras, 'Farm yard manure' was treated to be distinct from compost. In this State, production of compost was given a new orientation and was reckoned as being over and above the quantum of farm yard manure produced locally. Green leaves, household sweeps and such other rubbish were required to be preserved in a pit and not the main content of farm yard manures such as cow-dung. However, in practice, cow-dung constitutes the major part of the materials used for preparation of compost in most parts of the country. Thus, what is understood as compost is the bulk of farm yard manure preserved on more scientific lines in a standard sized pucca or katcha pit. Considering the way in which farm yard manure itself is wasted due to improper preservation, the composting process should be deemed very essential to derive maximum benefit out of the farm yard wastes.

7.4 During the plan periods, both the Central and State Governments have accorded considerable importance for the schemes of local manurial production, particularly compost development and enlarging the areas under green manures. During the Second Plan period, systematic efforts were made in most of the States to build up proper administrative and extension organisations to give a fillip to this scheme. Accordingly, field manure/compost development officers at various levels were appointed with varying designations. Details regarding the administrative structure and steps taken to strengthen the staff etc. have been discussed in Chapter III (Paras 3.7 and 3.8). Notable progress was reported during the Second Plan period in the production of quality compost in the States of Madras, Andhra Pradesh, Orissa, U.P. and some of the selected districts such as Yeotmal, Bhavnagar, Ganganagar, Shahabad, Balaghat and Kachar.

7.5 The programme of compost development during the Third Plan was specifically chalked out in twenty-two selected districts and in as many as sixteen others no specific programmes were drawn up for this item. Among the districts having a specific programme, the measures contemplated were of varying patterns. For instance, more 'intensive propaganda' was the main approach in the three districts of Andhra Pradesh, Trichur (Kerala) and Bhandara (Maharashtra). 'Fixation of higher targets' for this item was contemplated in the districts of Thanjavur (Madras), Muzaffarnagar (U.P.), Mandasore (M.P.) and Cachar (Assam). "Strengthening of staff" was the main approach in Ludhiana district of Punjab. 'Construction of pucca compost pits' in areas covered by consolidation of holdings was stressed in Aligarh and Jhansi districts of Uttar Pradesh State. Propagation of super-reinforced compost, issue of loans and grants to individuals and institutions were the other steps contemplated in districts such as Cooch-Behar, Sirmur and Mandya. Thus, during the Third Plan period a good beginning seems to have been made in a number of directions for augmenting the production of quality compost.

7.6 Data collected at the district level on the targets and achievements for this item during the first two years of the Third Plan are summarised in Table No. 7.1 (Appendix). Over 65% of the targets fixed in both these years, were reported to have been achieved both in package and non-package districts under study. The performance seemed to be better in the non-package districts than in the package. However, package districts of Andhra Pradesh, Assam, Gujarat, Kerala, Madhya Pradesh, Mysore and West Bengal, showed better performance than similar districts of the other States. Among the non-package districts, the programme fared better in Bihar, Maharashtra, Rajasthan and Uttar Pradesh States.

7.7 In an earlier discussion on this programme of augmenting local manurial resources (Chapter IV, paras 4.8 to 4.12), it has been brought out that this is one of the few programmes which can be effectively handled by local institutions both in programme planning and implementation. In regard to planning, however, much progress has not been made in many of the States. The association of local bodies in the implementation of this programme was examined in the study in some detail. According to our findings, the Panchayats were reported to have been actively associated in the implementation of the programme in the selected districts of Andhra Pradesh and Madras. In some other States, only in a few selected districts such association of panchayats was reported. For instance, only in Jhansi district of Uttar Pradesh, in Ludhiana district of Punjab, Cooch-Behar of West Bengal and Sambalpur of Orissa State, Panchayats had been involved in the compost development programme. In the other selected districts of these States such as Hissar of Haryana, Aligarh, Muzaffarnagar and Azamgarh of Uttar Pradesh and Burdwan of West Bengal, local institutions were not associated with this programme. From this it appears that no serious efforts are made in systematising this programme particularly in this aspect.

In a few other districts, such as Mandya (Mysore), Alleppy (Kerala), Cuttack (Orissa), Bhandara and Yeotmal (Maharashtra), Shahabad (Bihar) and Trichur (Kerala) Panchayats were reportedly associated along with institutions such as Youth Clubs, Farmers Unions etc. In none of our selected districts, association of cooperatives with this programme was reported. This situation further strengthens the conclusion that local planning and implementation in such an important programme dependent on local resources, is yet to become widespread. The feasibility of statutorily entrusting this as one of the major development functions to the panchayat needs careful considerations wherever it is not so.

7.8 The local institutions such as Panchayats and Cooperatives need, not only technical guidance, but also financial assistance in some measure to undertake this programme on scientific lines. Some efforts in this direction were noticed in certain States. Training in scientific preparation of compost was given to village leaders and farmers in some of the selected districts of Bihar, Andhra Pradesh and Mysore. In some other States such as Kerala, Rajasthan, Maharashtra, Madras, Orissa and Mysore, loan facilities were offered to these institutions for undertaking this programme. Besides such loans, grants/subsidies were also offered in these States. In almost all the districts of our study, it was reported that technical guidance was offered through the block agriculture extension staff to the village Panchayats. In Madhya Pradesh, incentives in the form of prizes to the best panchayats through compost competitions were also given. All these have generated some amount of interest in the programme, but on a limited scale. The programme needs much better appreciation both in its formulation at the higher levels and implementation at the level of the block and the village.

7.9 The success of this programme at the level of the village institution largely depends on the response of the cultivators not merely in appreciating the value of this important source of manure, but in adhering to the technical standards specified. Many times only the 'form' remains but the content is neglected. In this case if only the pit is dug to the prescribed size and no other effort is made to maintain the pit in proper shape and also observe the other details of sectional filling etc., much of the spirit of the programme gets lost. The agriculture extension machinery has to play a key role in this regard. Some of the extension methods followed in different blocks for propagating this programme are summarised in the following statement.

Extension methods used for increasing the production of rural compost in the package and non-package blocks.

Extension Methods	No. of blocks using the Extension Method.	
	Package	Non-package
1	2	3
1. Individual & group contacts	20	28
2. Method Demonstrations	14	23
3. VLT/GST Camps	7	10
4. Subsidy on pucca pits	3	7
5. Grants-in-aid	2	Nil
6. Compost competition	7	6
7. Compost weeks/Campaigns	5	5
8. Audio-visual publicity	3	3

Among the various methods reported, the first three seem to be in vogue in a large number of blocks. Method demonstrations in a way constitute the core of the extension methods for a programme of this nature. In nearly 60% of the selected blocks, such demonstrations are reported to be in operation. On the success of these demonstrations depends the extension of the programme to a large section of cultivators. But only in about 25% of our blocks, it was reported that these method demonstrations had a good impact. In the remaining areas, the impact was said to be negligible.

7.10 The blocks reporting ineffectiveness of these demonstrations attributed the following reasons :—

Reasons	Blocks reporting
1. Efforts of the extension agency in laying the demonstrations were too poor to be effective	Selected Blocks of Cuttack, Sambalpur, West Godavari, Raichur, Trichur and one block of South Arcot district.
2. Absence of follow-up measures after laying the demonstrations.	Jhansi, South Arcot and Cooch-Behar.
3. Non-availability of cow-dung in sufficient quantities.	Raipur.
4. Use of green leaf manure directly to the crops and the consequent reduction of the material for compost making.	Mandya.

The above reasons clearly show that more than anything else, the deficiency in the programme largely rests upon the inadequate extension efforts and follow-up of the programme in a good number of districts. Our observations also confirm that this programme is relatively more popular in the selected blocks of Maharashtra, Madras, Kerala and Punjab, because of the high level of manure mindedness among the cultivators and the incentives offered such as loans, grants and subsidies both to individuals and institutions. Apart from the lack of extension efforts, the most important bottlenecks impeding the programme are :

(1) Non-availability of suitable lands for construction of pits;

(2) Paucity of sufficient green and other waste material; and

(3) Consumption of a sizeable part of the cow-dung for fuel and other manurial purposes. This situation was reported largely among the Northern and Central States. Any systematic programme of compost production should be able to tackle such basic problems as otherwise there is not much of a chance of accelerating the production of this item.

7.11 The extent of adoption of compost preparation at the cultivators' level was also ascertained during this enquiry. Data on the proportion of selected respondents adopting this programme during the year 1962-63 according to the three main categories of cultivators are presented in Table No. 7.2. (Appendix) separately for package and non-package districts. So far as this programme is concerned, there was no clear difference in impact as between package and non-package districts. For instance, about 35% of the owners in both these types of districts were engaged in compost preparation during 1962-63. The proportion of tenants, however, was slightly higher in the package districts, while larger proportion of other categories of cultivators such as cultivator-cum-labourers and cultivator-cum-artisans were engaged in compost preparation during this year in non-package districts. This analysis also showed that a larger proportion of owner cultivators had evinced interest in this programme than the other two categories. Viewed purely from the angle of extent of participation in the programme, States such as Andhra Pradesh, Madhya Pradesh, Maharashtra, Punjab, Rajasthan and Uttar Pradesh seem to have fared better in this programme. On the basis of this data, it was however, difficult to conclude that the quality of the programme was also high in these areas.

7.12 The sample cultivators were also asked about the proportion of cow-dung used by them for different purposes. Data on this aspect are summarised in Table No. 7.3 (Appendix). The number of respondents reporting different proportion of use of cow-dung for compost etc. are likely to be duplicated because of multiple responses and hence, are not additive. The following inferences may be drawn from this table :

(a) Those who had reported use of cow-dung for compost were relatively smaller in number. But even among these few users, large percentage of cow-dung (76 to 100) was used for compost making. As between package and non-package districts, there was not much of a difference among users of this item.

(b) Among the manurial uses of cow-dung, larger proportion of our sample cultivators preferred to use this for farm yard manure rather than compost. Use below 25% of the total quantity available either for compost or for farm yard manure was negligible. This showed the awareness of the cultivators in larger use of the item for manurial purposes, wherever they choose to do so.

(c) Upto 50% of the cow-dung was used for purposes of fuel by quite an appreciable proportion of cultivators. Their numbers were much higher in non-package districts than in package districts. In Andhra Pradesh, Bihar, Orissa, Punjab and Uttar Pradesh larger proportion of cow-dung was used for fuel purposes.

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7.13 This confirms our earlier observation that a considerable part of cow-dung is still being used for fuel and other non-manurial purposes. This needs to be checked if this vital source of local manure is to be conserved for augmenting agricultural production. The basic problem in areas where this is being used for fuel purposes is lack of alternative and cheap source of fuel. While some stray efforts are made to advocate use of cow-dung for producing gas (retaining its manurial value) through the programme of installation of cow-dung gas plant, it has not spread and probably is beyond the reach of an ordinary cultivator. Therefore, a solution to this problem of cheap fuel should be sought in enlarging the fuel plantations in village common land through village institutions wherever possible. Otherwise, there does not seem to be any alternative for this highly popular and cheap source of fuel produced out of cow-dung in many areas.

7.14 *Green Manure* : This is another important source of local manure traditionally known to cultivators. In the Southern States and in States such as Orissa, parts of Uttar Pradesh, Gujarat, Bihar and Punjab, green manure cultivation is prevalent. This is mostly done in irrigated tracts. The green manure crop so raised is ploughed back into the soil before sowing of paddy. Where the cultivation of a green manure crop is not possible because of seasonal and other limitations, such as lack of water, green leaf manure collected from nearby forests is applied to the soil before cultivation of paddy. Thus, green manure application, as at present, is largely restricted to paddy growing areas. Efforts are also made to extend the use of this for other food and commercial crops. Besides, supplying plant nutrients, green manures also help in building up and maintaining the soil fertility.

7.15 During the Second Plan period, no significant progress was reported in the green manure programme in a majority of our selected districts. However, in the districts of West Godavari, Thanjavur, South Arcot, Surat, Mandya and Azamgarh, satisfactory progress on the implementation of green manure scheme was reported. It was only during the Third Plan, this programme received slightly better attention. Incentives in the form of free supply of green manure seeds, subsidies on the supply of such seeds and subsidy on irrigation from tubewell and canals were envisaged in a good number of States, notably in the Southern States and Uttar Pradesh. The targets and achievements on this programme for the first two years of the Third Plan as reported in our selected districts are presented in Table No. 7.4 (Appendix). This table reveals clearly that the programme of green manure was not important in all the States. In States where it was of some significance the achievement during these two years was quite considerable particularly, in the package districts such as West Godavari, Thanjavur, Ludhiana and Aligarh. These are the most favourably located districts from the point of view of irrigation and under the package programme, considerable stress seems to have been laid.

7.16 In the propagation of green manure programme, some of the pre-requisites are :

(a) adequate irrigation facilities;
(b) availability of quick growing varieties of seeds/seedlings/cuttings;
(c) fitting into the cropping pattern prevalent in the area;
(d) propagation of the new varieties among cultivators by way of demonstrations, free or subsidised supply etc.

These aspects were examined to some extent in this study and it was observed that in only half the number of selected districts, measures to popularise green manure were reported. Such districts were generally the districts located favourably in regard to irrigation facilities. So, the main constraint for this programme was irrigation and where this was not available, the schemes had limited scope. Where cultivation of green manure crop was difficult for reasons of non-suitability with the cropping pattern of the area, green leaf manure was applied as in Chattarpur district (M.P.) and Chittor and Karimnagar districts of Andhra Pradesh. Even here the limitation was the non-availability of such green leaves in nearby forests. In areas of perennial irrigation the tendency, of late, is to cultivate a food or cash crop instead of growing exclusively a green manure crop over a season. This is a very natural reaction from the cultivators and this tendency is bound to increase in future years with the pressure of population and the consequent need to increase food production. Thus, the scope for enlarging areas, for exclusive green manure cultivation, appears to be somewhat limited in future. Therefore, the orientation of this programme in the years to come has necessarily to be on :

(a) raising of green manure plant such as Glyrecedia exclusively on field bunds so as to provide sufficient green leaf for the crop at least during one season.

(b) Evolving of quick growing species which can produce enough green matter in about 6 to 8 weeks instead of about 10 to 12 weeks as most of the present types such as Sesbania, Dhaincha, Sunhemp, etc. take; and

(c) Introduction of dual purpose crops which produce both grain and green manure. Most of the leguminous types of crops come under this.

7.17 In Thanjavur district of Madras State, green or black gram seeds are sown in the paddy fields just a fortnight before the paddy crop is harvested. With the availability of moisture in the field, the crop comes up well after the paddy harvest and provides both grain and certain amount of manure to the soil. This is a traditional practice but needs to be pursued more extensively as this is not quite wide-spread even in this area. It is also a common belief in certain parts that cultivation of crops, such as groundnut, Indigo and other leguminous varieties such as horsegram would improve the soil texture and add to its manurial contents. So, what is required at present is to evolve a suitable pattern for a region with a combination of the above mentioned types so as to maximise the use of this important local sources.

7.18 The most important reasons for not adopting this programme in the blocks where this was not extensively done, were reported to be the following:

Reasons	No. of blocks reporting
1	2
1. Lack of irrigation/moisture in the soil	35
2. Not much scope for raising of green manure in the existing cropping pattern	23
3. Recommended crop did not respond well and has not been appreciated by the cultivators	16
4. Lack of extension effort	13
5. Shortage of green manure seeds	12
6. Extensive floods and heavy rainfalls	4

7.19 The major limitations for large scale expansion of this programme which were mentioned earlier are borne out from the experience reported in the selected blocks. The suggestions made in paragraph 6.17 may to some extent help overcome these limitations at least in regions offering greater potential for this programme. In tracts where cultivation is mainly dependent on precarious rainfall, probably this programme is not of much significance. For dry crops such as millet, pulses, etc., application of green manure as such does not so much arise. Augmenting the production of green leaf in such areas will, however, promote the compost production programme.

7.20 *Other local manurial resources*: Besides the two principal items of local manures discussed so far, the use of a few other items such as night-soil, tank silt and urban compost is also known to cultivators in some areas. While use of tank silt is a traditional practice in tank irrigated areas, use of night-soil and urban compost is yet to become popular. There is considerable scope for increasing the production on both these items. The number of our selected blocks reporting the use of these items is given below :

Types of other local manures	Number of selected blocks in which used	
	Traditional use	Through the efforts of the block agencies
1	2	3
1. Night-soil	Nil	6
2. Tank silt	13	9
3. Urban compost	6	7

7.21 The number of blocks, in which these were reported, was somewhat low and even in these blocks the programme was confined to a few villages. For instance, night-soil scheme was in operation in a few villages of Orthanad block of Thanjavur district and Bargh block of Sambalpur district. In two blocks of Rajasthan viz Sardulnagar and Rashmi, it was proposed to offer loans to Panchayats for conserving night-soil and construction of latrines, but the amount so ear-marked remained unutilised. The panchayats did not seem to have evinced much interest in this programme. Use of trench latrines was advocated in the villages of Sirmur district (Himachal Pradesh). The potentiality of night-soil as a good source of manure is not realised in many areas. In rural areas, the real problem is to provide a common place like latrines for this purpose. Even where attempts were made to provide these, the people are not accustomed to this type of facility and would prefer to follow their traditional practice of using adjoining fields for nature calls. In many a village indiscriminate use of village surroundings including the lanes poses a serious problem of health and any practical step taken in this regard would mean better health for the people and good manure for the fields. Here again there is ample scope for the local institutions to play a significant part. There are stray instances where Panchayats have played a useful role in this programme and a pilot experiment of night-soil preservation on proper hygienic methods is worth a trial all over the country.

7.22 The value of tank silt as a manure is fairly well-known to cultivators. But, for a variety of reasons this is not done systematically and indiscriminate removal of silt might also cause damage to their irrigation source. In all tank irrigated areas, a sound programme of de-silting the tanks should be chalked out with the active involvement of the Panchayats. Under the democratic decentralisation process, in most States, minor irrigation sources are vested with the local authorities. The programme of periodical maintenance of tanks also exists in many areas. De-silting of tanks under such maintenance schemes should be linked up with the people's participation. Both the Government and the cultivators stand to gain by this linkage as those who want to use this for manure purpose should find it attractive enough to work on the project with nominal incentives. What generally happens today is that tank silt is used for strengthening of the tank bunds. This precious source of manure can be saved if the engineering authorities find alternative material for strengthening the bunds wherever necessary. In most cases, however, de-silting alone would be the problem for the irrigation source and this method would serve the purpose at a very low cost both to the beneficiaries and the Government. In Azamgarh block of Uttar Pradesh, a tank deepening programme was undertaken in the year 1959-60 with a subsidy of Rs. 2/- per 1000 Cft. of silt removed and used on the fields. Similar schemes were reported from Khairana block of Muzaffarnagar district and the blocks studied in the South Canara district of Mysore State. This, however, needs closer examination by the experts in the fields.

7.23 Production of urban compost is of limited impact as the production centres are limited compared to the areas needing this manure. Generally, cultivators living in the outlying villages around towns/cities are in a more advantageous position to avail this compared to interior villages. To encourage cultivators, for using this manure, a small subsidy of Re. 1/- per ton for a distance upto 3 miles, and Rs. 2/- per ton for a distance of more than 3 miles was offered in one of the blocks of Rajasthan. The problem in regard to urban compost is more in relation to increasing the production rather than distribution. There is sufficient demand from the cultivators and there is no particular problem faced by the Municipalities in the disposal of this item in a large number of areas. Given proper financial resources to these urban institutions, there seems to be sufficient scope for augmenting this source.

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CHAPTER VIII

SUMMARY OF FINDINGS AND SUGGESTIONS

8.1 The use of chemical fertilisers in the country is relatively of a recent origin, the intensive efforts almost synchronising with the planning era. This has been accorded top priority in the new strategy for increasing agricultural production during the Fourth Plan period. The average Indian farmer is more receptive to new ideas, methods and materials today than fifteen years ago, thanks to the significant role played by the National Extension Service and the Community Development Programme. Compared to the pre-Plan period the rise in the consumption of N, P and K types of fertilisers as at the end of each Plan period registered very significant increases.

8.2 The enormous growth in fertiliser consumption during the Plan periods has thrown up a number of problems relating to production, import, distribution and extension. Efforts were also directed to augment the production of various types of local manures.

Soil tests and research

8.3 The programme of establishing soil testing laboratories in each State was taken up seriously only during the Second Plan period. It was only in the State of Bihar, U.P. and H.P. the soil testing facilities existed prior to the Second Plan period. By the end of Second Plan each of the 15 States had set up at least one soil testing laboratory. In all, 29 such institutions had been established mostly in collaboration with the T.C.M. of U.S.A. In the Third Plan, all the States except Mysore and Maharashtra, had fixed targets for the establishment of soil testing laboratories. Against the target of 47 Centres in 13 States, 12 had actually been established by the second year of the Third Plan. Bihar and U.P. had programmed to set a large number of soil testing centres.

8.4 The problems of a general nature in the programme of soil testing and research were (a) want of regular flow of samples in adequate numbers; (b) non-maintenance of follow-up data on yield etc.; (c) under-utilisation of the existing capacity of the laboratories due to incomplete and inadequate identification particulars accompanying the samples; (d) inability to set up the proposed centres during the Second and Third Plan period owing to foreign exchange difficulty; (e) unsatisfactory system of communication of the results of soil tests and the recommendations on them; and (f) the absence of any role for the District Agricultural Officer in the entire programme of soil testing.

8.5 Lack of adequate data on soil testing was reported from the States for formulating manurial recommendations. The manurial schedules were to be prepared according to broad soil types and other fragmentary information mainly collected from limited field experiments. Only in Madras State, the basis for fixing manurial schedules was reported to be based on the soil test-crop response studies conducted by the I.A.R.I. In Gujarat, it was thought more practicable to consider crop response to particular dosage rather than soil test results in this content. Thus, in many States, the fertiliser recommendations for different crops were of a general type covering at times the whole region of the State.

8.6 As regards propagation of soil test results, the position was disappointing in many of these districts. The maximum effort observed was the communication of the results direct to the ryots concerned by the soil testing agency. In half a dozen districts, however, some concerted efforts such as, conducting of soil testing week, inclusion of a sub-plot in the composite demonstration plot under the package programme and preparation of input cards denoting the fertiliser recommendations and their doses based on soil analysis, were reported. The deficiency seemed to lie in the absence of any link between the soil testing programme and the production programme at the village level and also in the inadequate coordination among officials at different levels. Another important feature was that the entire programme was assigned a low priority in the overall agricultural production programmes.

8.7 Of the 4,373 sample cultivators interviewed, only 54 or 1.23 per cent of them reported that soil tests were carried out in their fields and as many as forty of these belonged to the intensive districts. 47 out of the 54 respondents reporting such tests had their soils tested during 1961-62 and 1962-63. The most revealing part of this analysis was that only a dozen of the reporting cultivators stated that soil test results were made available to them with recommendations on fertiliser application.

Attitudes of villages on the effect of fertiliser use .

8.8 The attitudes as reflected in the responses relating to effects of fertiliser use indicated the need to strengthen the average farmer with better knowledge of the technical aspects of the adoption of chemical fertilisers. In a little over 37 per cent of the sample villages, adverse soil effects including depletion of soil fertility, acidity and hardening of soils, was apprehended while another 18 per cent of the villages reported no ill-effects if fertilisers were used along with organic manures. Regarding yields on the other hand, there was better appreciation and only in 17% of the villages the non-response of yields to fertiliser application was reported. Susceptibility to pests/diseases consequent on the use of fertilisers was opined to be not marked in the sample villages.

Administrative set-up and execution of the programme

8.9 In matters of planning and implementation of fertilisers programmes, the Agriculture Department plays the major role with the Director of Agriculture in the overall charge of planning at the State level except in Madras State, where this work was mainly looked after by the Revenue Board. At the district level, the District Agricultural Officer plays a key role on the technical as well as supply aspects of the fertiliser programme It was observed in the working of entire programme that while planning and implementation of decisions largely came under the purview of the district level committee or Zilla Parishad, the actual handling of fertiliser receipts (pool fertilisers only) was entrusted to the Cooperatives on a monopoly basis. At the block level, the Block Development Officer was in overall charge of planning and implementation of this programme with the assistance of Agricultural Extension Officer. The Extension Officer and the V.L.Ws. were concerned in many areas with mere extension functions; supply functions having been taken away from them in recent years.

8.10 In most of the States, there is a separate set up for administering the various schemes related to the production of local manurial resources. Except in Assam, in the remaining States there was a State level officer exclusively in charge of local manurial programmes. At the levels of district and block, there was no uniformity in the pattern of staffing for this programme. However, over the Plan periods, considerable importance was attached to the development of these resources and to the extent separate trained technical staff was warranted the same had also been provided.

Fixing of targets for chemical fertilisers

8.11 Targets for distribution of fertilisers were generally fixed at the State level by the Agriculture Department except in Madras State where it was attended to by the Revenue Board, and approved by the Planning and Development Departments of the State Governments. These targets were linked to the agricultural production targets indicated to various States by the Planning Commission at the time of Plan formulation. Targets for a State were, by and large, broken down to division, district and block levels. There was, however, no standard method adopted by the State Governments for arriving at realistic procedure for fixing targets of this programme.

8.12 Among the States reporting, as many as nine of them indicated that allocation of fertilisers was less than their demand. Only in Gujarat and Rajasthan the situation was reverse. Most of the States attributed the shortfall in achievement to familiar reasons such as ambitious targets, low demand, administrative lacunae etc.

8.13 The formulation of targets for production of local manurial resources was generally based on the availability of local manurial stocks and the potential for the various types of materials used. The basis of fixation of targets for rural compost differed from State to State and by and large, they were related to the number of livestock, rural population etc. In Orissa, however, certain yardsticks assigned to various input factors were taken into account while fixing such targets.

8.14 The shortfall in achievement of this programme was mainly attributed to lack of interest among the cultivators besides inadequate extension efforts. Though this was too general an explanation, yet this was the most commonly prevalent situation in a number of districts. Lack of fuel, lack of additional material by way of refuse, lack of grazing facilities and want of adequate space near the village, were some of the other reasons reported in this regard. The programme of compost production seems to have made some headway, if distinction is not drawn between indigenous compost and quality compost. As regards green manure, the achievement had fallen short owing to inadequate supply of seed, lack of irrigation facilities, unsuitability of cropping pattern and lack of fencing facilities.

8.15 In as many as 12 out of 15 States, no efforts were made to prepare any detailed working programme for achieving fertiliser targets. In this respect, the best that was done was to break up the targets fixed at the State level into district, block and village levels. It was only in West Bengal, it was reported that on the basis of a review of the programme the weak links in system of distribution were weeded out in order to revitalise the set-up.

8.16 The two crucial aspects of fertiliser programme are supply arrangements and credit extension. Judged from the minimum needs of the programme it was observed that a comprehensive and coordinated working programme was yet to be attempted in a majority of States. With the advent of I.A.D.P. an integrated approach to agricultural production programmes has been evolved and this seems to be worthy of emulation. In some districts, working programme is reported to have been chalked out prior to each crop season. Working programme at the block level did not mean anything more than the breaking up of the targets received from above to the lower level units.

Provision of credit

8.17 It was observed that the cooperative structure was still weak in a large number of States and the loans issued by them were not always production oriented. In some of the States, however, attempts were made to link up cooperative credit with the issue of fertilisers but it was only in the I.A.D.P. districts this procedure appeared to be more effective.

Role of voluntary institutions

8.18 In majority of the States, panchayats, farmers' associations and such other voluntary agencies were yet to be actively involved in the agricultural production programmes. In States like Maharashtra, Orissa, Andhra Pradesh and Rajasthan, Panchayats played limited role in as much as they were required to prepare the production plans. The role of farmers' associations in the fertiliser programme was generally observed to be superficial in most of the selected areas.

Farm Planning

8.19 With the advent of I.A.D.P. local planning was given a new orientation and efforts in this direction became more systematic. The initial impact of package programme on farm planning, however, revealed that less than one-third of our sample respondents were participating in farm planning during the two years of our reference period viz. 1961-62 and 1962-63. The number of participating cultivators as well as the number reporting production plans had increased substantially during the latter year. On the whole, it can be stated that farm planning as an instrument of increasing agricultural production had made a good start in the intensive districts.

Distribution arrangements and extension

8.20 There was no clearcut policy about the opening of additional fertiliser distribution points in any of these States. The initiative to open a distribution depot for fertiliser supply rested mainly with the block authorities. Our field observations in this regard showed that a realistic programme relating to the network of distribution, was yet to be thought of at the highest level in a large number of States. Cooperative was the main agency entrusted with the distribution work while in some States such as West Bengal, Assam, H.P. and Kerala, this was also entrusted to private traders and other departmental agencies.

8.21 As regards the growth of cooperative distribution points in the field of fertilisers, their share increased from 30 per cent at the end of first Plan period to 78 per cent by the second year of the Third Plan. The number of cooperative depots during this period also increased by 25 times. The growth of cooperative distribution points was, however, more pronounced in package districts. As regards location of these points, in two-thirds of the selected blocks, it was reported that there was no problem of inconvenient location or inadequate number of sale points. Only in one-third of the selected blocks, the distribution points were said to be inconveniently located from the angle of facilitating speedy movement. The hilly and less developed tracts posed serious bottlenecks and hence had to be tackled on special footing. Private dealers were also quite active in fertiliser distribution in almost all the States. The successful functioning of FACT in Kerala State was a good example of efficient organisation in the field of fertiliser distribution.

8.22 A little over three-fourths of our respondents in package districts obtained their supplies from the cooperatives. The private agencies were resorted to only by less than one-fifth of our respondents. Similar trend was noticed in regard to the quantum of fertilisers distributed. Large proportions of nitrogenous and phosphatic fertilisers were supplied by the cooperative agency in both the years of the reference period viz. 1961-62 and 1962-63. Such a dominant role of the cooperative was mainly due to the monopoly rights vested in them in most of the States.

Facilities and inducements

8.23 Towards stepping up the use of fertilisers, various facilities and inducements were offered to the cultivators. Regarding the opening of adequate number of sale points, in 10 out of 15 States, there were some plans to increase the sale depots to cope up with increased demand for fertilisers. In regard to the provision of timely and adequate credit to the cultivators, it was found that there was need for channelising all agricultural loans through a common agency. It was also observed that many of the cooperative institutions engaged in the task of issuing short-term loans were not equipped to deal with the agricultural inputs such as fertiliser, seeds etc. required by the farmers. However, considerable expansion had taken place in advancing credit to cultivators both in kind and cash over the Plan periods. A more clearcut trend towards the sale of fertilisers on credit was observed in package districts. This was, as already pointed out, the result of the preparation of farm production plans for each individual participating cultivator. The proportion of selected respondents availing cash or kind loans was rather meagre compared to the total number in the sample. Subsidy in some form or the other was offered to cultivators in a number of States to promote the use of fertilisers.

Extension programmes

8.24 The Block Extension agency has been playing a major role in educating the farmers although some private traders were also doing similar work. However, a large ground is yet to be covered and private manufacturing agencies have scope to strengthen the efforts of the department in this direction.

8.25 Among the different extension methods adopted demonstration was one of the most important. The important stages in the process of popularising new agricultural practices are trials and demonstrations. Simple fertiliser trials were conducted for quite some years in most of the States. There were also a variety of demonstration programmes during each year in all the States. The crux of the problem, however, was proper coordination at all levels in chalking out a non-overlapping and effective programme of demonstrations. Proper supervision and follow-up on the implementation of the demonstration programmes was not exercised in a good number of observed areas.

8.26 Cultivators agreeing to take up the demonstrations were generally provided with the facilities such as free supply of improved seeds, implements and also fertilisers. On account of this, these demonstrations had proved quite attractive and also led to the concentration of these repeatedly among the influential and progressive ryots.

8.27 The technical guidance in laying out such demonstrations was mostly entrusted to the V.L.W. who, on the one hand, was not fully conversant with all the technical aspects and, on the other, was loaded with a variety of other types of work. It was also true to some extent that the entire programme of demonstrations was treated in a rather casual and routine fashion. The Agricultural Extension Officer of the Block who is expected to play an important role in this programme had not really been doing much (according to field reports) in 35 out of the 38 selected districts.

8.28 It has to be stressed that demonstration is one of the effective extension methods for popularizing fertiliser use, especially for irrigated crops. These had also been responsible for enthusing a sizeable section of the cultivators to use ferilisers. But, where this method had proved ineffective, the reasons attributed were improper organisation, lack of proper follow-up measures and lack of knowledge among the V.L.Ws. about the details of the technical recommendations.

Knowledge and use of fertilisers

8.29 About 89.5% of the sample cultivators in the package and 86% in the non-package areas had acquired knowledge of one type of fertiliser or other as at the end of 1962-63. The actual users among them formed about 68% and 50% in package and non-package areas respectively. A very high proportion of the sample respondents in intensive development areas of all States except Orissa and Rajasthan had used some type or other by 1962-63. The proportion of users was not more than 85% in non-package districts of any State.

8.30 Proportionately, larger number from each category of respondents (owners, tenants and others) had used chemical fertilizers during 1962-63 in intensive development districts than in non-package districts; this was more pronounced among tenant group of cultivators. The tenants in non-package areas accounted for a smaller proportion of users in 1955-56 than in 1950-51 and the same trend continued upto 1962-63 when it more or less levelled up. This may, presumably, be due to the faster tempo of acquisition of knowledge about fertiliser use accompanied by improvement in the availability of necessary resources for procuring supplies.

Use of N, P, K and Grades :

8.31 By the end of 1962-63 nearly all respondents were aware of N group of fertilisers in both types of districts. From among the knowledgeable persons three-fourths from package and about half from non-package areas had begun using fertilisers by the end of this period. In almost all the States except in Orissa and Rajasthan a large number of respondents in package districts used N-type. Both, the spread of knowledge as well as the use of this group of fertilisers gathered substantial momentum after 1960-61.

8.32 As between different categories, respondents in all the groups from package areas were better informed, though initially the knowledge of this type of fertilisers was poor among all the three categories in both types of districts. In the package districts there was hardly any perceptible difference in the level of users between the tenants and owners while in non-package districts the owners had a lead of about 12% over tenants.

Phosphatic fertilisers

8.33 Next to 'N' fertilisers, the most popular is the phosphatic group. By 1962-63, about three-fourths of those who were aware of any fertilisers in package and about 58% in the non-package areas knew of phosphatic fertilisers also. The actual users from them, however, were less than 50% in both types of districts. In Kerala and Maharashtra larger proportions of knowledgeable respondents from non-package areas had used P. fertilisers than those from package areas. Among the different groups of users covered in the enquiry owner cultivators far out-numbered both tenants and others.

Fertiliser Grades

8.34 Compared to 'N' and 'P' fertilisers, mixture-grades were less known to the respondents in both types of districts. Even at the end of 1962-63 awareness hardly extended to 29% in package and 20% in non-package areas. Among the three categories of respondents owner cultivators were the least informed of this type upto the end of 1960-61 in package districts. But, by the end of 1962-63 proportionately, more owner cultivators went in for mixture grades in both types of districts than the other two groups.

Cropwise users of fertilisers

8.35 It was observed in the package districts that more than 90% of respondents applying any fertilisers to the four crops *viz.* Paddy, wheat, sugarcane and groundnut, had used N-fertiliser on part of their crop areas. In respect of groundnut growers, however, 86% of the fertiliser users used phosphates in non-package areas while this proportion was as low as 11% in package districts. As regards use of fertiliser grades, it did not become as popular as the other two for any of these crops.

8.36 Respondents apply fertilisers only on part of their crop area, both fertilisers and manures, on certain other areas and manures only on some areas. The proportion of respondents using either fertilisers only or fertiliser in combination with manures on irrigated Paddy areas was larger in package than in the other type of districts. But, exclusively manure was used by larger numbers in non-package districts. On the other hand, in the case of unirrigated Paddy the application of fertilisers or fertilisers in combination with manures was limited in both types of districts. Between the States large proportions among irrigated Paddy growers in package districts of Andhra Pradesh and Kerala used mainly chemical fertilisers. For non-package areas, similar trend was noticed in U.P. and Punjab. During 1962-63, on an average, 65% of irrigated Paddy growers in package districts applied both fertiliser and manure compared to 40% in non-package districts. With regard to unirrigated paddy only in three States some areas in I.A.D.P. districts were treated only with chemical fertilisers, while in respect of non-package this was noticed in Bihar and H.P.

8.37 The proportion of respondents using both fertilisers and manure on part of their wheat area was low, while the number of exclusive fertiliser users increased in both types of district over the period of time. Among the States growing this crop Bihar, followed by Punjab had the largest proportion of growers using only fertilisers in package areas.

8.38 In respect of sugarcane again, large number of growers from intensive development areas preferred the use of fertiliser in combination with manure, while such preference was for exclusive use of manure in non-package districts. Exclusive application of fertilisers for this crop was not very popular in either type of district. As for the States, in West Bengal, Punjab, Mysore, Kerala, Gujarat and Bihar large number of cane growers from package areas went in for exclusive manure use only while in respect of non-package, Mysore had the largest number of such users.

8.39 The combined use of fertilisers with manure for groundnut did not appear to be very popular in both types of districts. The crop being mainly unirrigated exclusive application of manures seemed to be the dominant practice in package as well as non-package areas.

8.40 Crop-wise analysis of area treated with fertilisers and/or manure revealed that larger proportions of irrigated paddy area in both types of districts were treated with the combination of fertiliser and manures. In the case of sugarcane too, similar situation was noticed. The unirrigated paddy area so treated also showed some marginal increase in case of package districts, while in non-package districts such area remained almost stationary. In the package areas of Bihar, Gujarat, Mysore, Madras and Kerala, the above phenomenon was pronounced, while it was so in the non-intensive areas of Andhra Pradesh, Madras and Mysore.

8.41 A bigger proportion of wheat area was either treated with fertilisers only or with manures than in combination. Between the two types of districts, area treated with fertilisers exclusively was larger in intensive development areas. The area treated by manures only, however, declined by about 11% in the package districts, while it remained stationary in non-package areas. In Bihar and Punjab much of the crop area was treated exclusively with fertilisers in package districts. Significantly, in the package district of Rajasthan, the area treated exclusively with manures was as high as 85%.

8.42 In the intensive development districts larger areas under groundnut crop were treated with fertilisers only, while in non-package districts manures were used on proportionately, larger areas. About 80% of the crop area in the package district of Punjab was only fertilised while exclusive use of manure to a large extent was reported from non-package areas of Madras and M.P.

Per hectare application of N-fertilisers in package and non-package districts upto 1962-63

8.43 On Paddy a lower dosage of N was applied in package districts than in the non-package areas between 1959-60 and 1962-63. With regard to wheat crop, on the other hand, the reverse was the case. The sugarcane growers of intensive development areas applied comparatively higher dose in each of the four years though the per hectare dosage registered a decline from 108 Kg. to 77 Kg. between 1959-60 and 1962-63. To groundnut crop, while a higher dosage was applied in the package districts during the first two years of the reference period, in the later years the application in non-package districts more than doubled.

8.44 The quantity of N-fertilisers used by the respondents when they first adopted and the quantity used by them in 1962-63 for three different periods was also examined. Between the two types of districts, the growth in the use of N-fertilisers was significantly high in the package areas. Among the different categories of respondents, owner cultivators in both types of districts used more of N in 1962-63 irrespective of the period of adoption. In the case of tenants, the maximum increase in the quantity used has been by those who initially adopted it during the first period (1950-51 and before) in package districts and those in the second period in the non-package areas. Users from the category of 'others' who had initially applied N fertilisers during the second period in package areas reported about 76% less in 1962-63 while those in non-package districts increased the quantity by 171%.

Use of fertilisers in combination with compost/FYM and/or Green Manure

8.45 The non-package districts lagged very much behind in the application of any one of the fertiliser-manure combinations on irrigated paddy both in respect of users and the area so covered. With regard to unirrigated paddy, the use of any of these combinations was still less popular. Both for wheat and sugarcane the combined use of fertiliser and compost/FYM seemed to be more popular. Among the cane growers in non-package areas, the proportion using the above combinations was much less compared to their counterparts in the other type of district. But, in respect of triple combination, large proportion of both users and areas was found in non-package districts.

Cultivators' preferences between organic manure and fertilisers

8.46 Preferences shown by cultivators between chemical fertiliser and organic manure for their important crops revealed the following trends. In the package districts, only a small fraction of growers of irrigated paddy desired to use exclusively chemical fertilisers for their crop, while in non-package this proportion was more than double that of the package. In unirrigated Paddy also more or less a similar trend was noticed. But, 70% of the unirrigated paddy growers in both types of districts preferred organic manure. As for wheat crop, bulk of the growers in both package and non-package areas preferred to apply organic manure to their crop. Bulk of the cane growers from both areas also had opted for manures only. But for groundnut, a larger proportion of growers for intensive development areas desired to use fertilisers only, while in non-package area such preference was for manures.

Choice within the N group

8.47 The choice of the largest number of respondents was Ammonium sulphate for both irrigated and unirrigated crops in both types of districts. All the irrigated paddy growers in the non-package district of Rajasthan, however, opted for Urea. The majority of respondents in both types of districts desired to use Ammonium Sulphate for their wheat crop as well. But, in respect of sugarcane crop while larger number of growers from package districts preferred Ammonium Sulphate, this was less than half in non-package areas. The highest proportion of cane growers from both types of districts of Punjab desired to use C.A.N.

Reasons for preferences

8.48 By and large, most of them desired to use Ammonium Sulphate as it helped plant growth and better yield of all the four crops. Only a very limited number opted for the use of Urea and C.A.N. for the same reasons. A few of the wheat growers in both types of districts and some sugarcane growers in non-package areas seemed to prefer C.A.N. as it suited their soils apart from reasons of yield.

Reasons for not covering all crop areas with fertilisers

8.49 The limitations that stood in the way of covering the entire crop area with fertilisers revealed some vital gaps in the system of extension work and programming of the fertiliser distribution. The problem of credit and also lack of conviction had been reported by Paddy growers as major limitations in the intensive development areas where better credit facilities and also better staffing pattern were in existence. Another interesting phenomenon as between the categories of respondents was that proportionately, more owner cultivators growing irrigated paddy had the problem of inadequate credit. The main hindrance for covering the entire wheat area in package areas was credit, but this was mentioned by smaller number in non-package district. Difficulty of supply was mentioned comparatively by a less number of respondents. Larger number of respondents from each category in non-package areas had mentioned the unsuitability of the soil/lack of irrigation etc. as a limiting factor. Only a limited number of respondents raising sugarcane crop had not covered their entire area under the crop. Lack of credit was the important limitation; the next in importance being the lack of conviction. The situation was not different in respect of groundnut crop also.

Knowledge of recommended dose

8.50 A large majority of the growers of the four crops in both types of districts did not know the recommended doses to be applied. The highest proportion of knowledgeable persons was (14.6%) among the irrigated paddy growers of package areas; the level of awareness being only 2% for non-package. For the rest of the crops it was below 10% in package areas while the same was only a fraction in non-intensive areas.

Development of local manurial resources

8.51 The progress made and problems confronted in augmenting the production of local manurial resources was also examined with reference to three principal types of such manures *viz.* (1) Compost, (2) Green manure, and (3) other local manures such as night soil, tank silt etc. During the

Plan periods both the Central and State Governments accorded considerable importance for the schemes of local manurial production, particularly compost development and extending the area under green manure. Notable progress was reported during the Second Plan period in the production of quality compost in Madras, A.P., Orissa and U.P. The programme of compost development during third Plan gathered added momentum and specific measures were contemplated in varying pattern lie intensive propaganda, fixation of higher targets, strengthening of staff, propagation of super reinforced compost etc.

8.52 As regards targets and achievements at district level during the first two years of Third-Plan in both types of districts over 65% of the targets fixed in both years were reported to have been achieved. The performance seemed to be better in the package districts than in the non-package. On programme planning in this regard, however, much progress has not been made in many of the States. No serious efforts seems to have been made in States other than Madras and Andhra Pradesh to systematise this programme and elicit cooperation of local bodies in its planning and implementation.

8.53 The success of this programme at the village level largely depends on the response of the cultivators not merely in appreciating the value of this type of manure but also in adhering to the technical standards specified. Thus many times the form remained but the content was neglected. Many extension methods were followed in different blocks for propagating the programme and method demonstration constituted the core. As regards the extent of its impact, hardly 25% of the blocks were positive in their response. In the rest it was negligible.

8.54 The important bottlenecks impeding the programme was non-availability of suitable lands for construction of pits, paucity of sufficient green and other waste material and consumption of a sizeable part of the cow-dung for fuel and manurial purposes. Between package and non-package districts there was no clear difference in impact as far as this programme was concerned.

8.55 Among the different categories of respondents larger proportion of owner cultivators had shown interest in this programme than the other two categories. As regards the extent of utilisation of cow-dung for purposes of compost, those who had used this component for compost were relatively small in number. Larger proportion of sample cultivators preferred to use this as farm yard manure than as compost. Diversion of more than 50% cowdung for fuel purposes was found among an appreciable proportion of cultivators and such incidence was much higher in non-package districts than in package. The basic cause for this diversion in those areas was the lack of alternative and cheap materials for fuel purposes.

Green Manure

8.56 In the Southern States and in States such as Orissa, parts of U.P., Gujarat, Bihar and Punjab, green manure cultivation is widely prevalent. During the Second Plan period no significant progress was reported in a majority of selected districts. It is only in Third Plan this programme received slightly better attention and incentives such as free supply of green manure seeds, subsidies on supply of seeds and also irrigation were envisaged. Some significant achievement has been made in this programme in some of the package districts (West Godavari, Thanjavur, Ludhiana and Aligarh) which are most favourably located from the point of view of irrigation facilities. In many cases cultivation of green manure crop was difficult for reasons of non-adjustability with the existing cropping pattern and also lack of irrigation/moisture in the soil.

8.57 With regard to other local manurial resources use of tank silt was a traditional practice in tank irrigated areas while use of night soil and urban compost was yet to become popular. In this field the local institutions can play a significant role but there were very few instances where Panchayats played a useful role in this direction.

8.58 Production of urban compost is of limited impact as the production centres are limited compared to the demand. Thus the problem in this direction is more in relation to increasing the production rather than distribution. Given proper financial resources to the urban institutions there seems to be sufficient scope for augmenting this source.

Suggestions

8.59 The working of the programmes of distribution of fertilisers and production of local manurial resources revealed several inadequacies in the course of their implementation. A clearer picture has also more or less emerged on the pattern of use of various types of fertilisers among the cultivator respondents and the problems encountered in meeting the hard preferences and firm prejudices of the agriculturists for and against different fertilisers. In this context, some important issues have come up which need consideration and appropriate action.

8.60 The analysis of the state of knowledge among the selected respondents of the recommendations regarding the use of fertilisers and the respective doses reveals the urgent need to equip the average farmer with better technology and skills to minimise indiscriminate and wasteful application of this scarce input. The integrated approach as conceived under the package of recommendations in intensive development areas seems to be the solution in all areas relevant for fertiliser application.

8.61 The package of recommended practices in I.A.D.P. districts, include among other things, large scale testing of soil samples so as to arrive at scientific dosages of different types of fertilisers for different crops as well as for the same crop under different types of soils. If large areas are to be covered by a systematic soil survey and testing programme, enormous expansion in the facilities is necessary. Lack of foreign exchange for the requisite equipment in the existing laboratories, is said to be impeding this programme in certain areas and requires detailed study and examination at higher level. But, streamlining the existing facilities on the basis of broad soil tracts, systematising the working of the laboratories with adequate staff and equipment, ensuring a regular flow of samples to the laboratories, maintenance of proper records on the samples tested and resultant recommendations, quicker communication of the results to the cultivators through the extension officers functioning at the district and block levels etc. will go a long way in promoting the rational use of chemical fertilisers.

8.62 The administrative set-up for the execution of fertiliser programmes seems to suffer from certain vital gaps. The feasibility of providing a 'Fertiliser Officer' of the status of D.A.O. for each revenue district to handle all the supply and other routine measures is to be considered as a measure of strengthening the administrative machinery. This is apart from the much needed reorientation to the D.A.Os. who should be mainly extension functionaries devoid of the day-to-day administrative and supply functions.

It needs to be cautioned here, that in the process of providing the requisite number of specialist staff at the operational levels, care should be taken to avoid creation of too many specialists for various segments of the same programme. This is bound to hamper the growth of a unified approach in the implementation of closely related programmes.

8.63 The urgent need to achieve a radical break through in the agricultural production programmes resulting in increased per acre yields makes it imperative that fixation of targets and the distribution arrangements should be worked out on a scientific basis and demand factors. It is, therefore, essential to examine the needs of each individual region within a State in terms of the potential for consumption based on irrigation, crops grown and response from farmers. The village should be the unit for purpose of planning in this direction. Association of village and other local institutions in the formulation of schemes is worth serious consideration. The panchayats can play a fruitful role in planning as well as the implementation of the programme of local manurial resources Farm planning as an instrument of increasing agricultural production has made a good start in package areas and the possibility of extending this to other areas should be explored. Sustained efforts are necessary to educate all classes of cultivators on balanced fertilisation of different crops.

8.64 In the field of credit the pressing need is to channelise all types of loans, short or medium-term, through a single agency. Much more important is to make such loans production oriented and issue the major part in kind rather than cash, thereby minimising misutilisation.

8.65 As regards laying of demonstrations to ensure better effectiveness, the size of the plot should be nearer the average size of the holding in a village. For fertiliser demonstrations a minimum of one acre should be deemed essential. It is also very important to exercise considerable care in drawing up the number of demonstrations so that the maintenance of specified technical standards and thorough supervision are ensured.

8.66 In the development of local manurial resources, there is urgent need for better planning of the schemes rather than leaving it to the good sense and discretion of individual cultivators. The feasibility of statutorily entrusting this as one of the major development functions of the panchayats at village level needs careful examination. As regards the 'green manure programmes, a reorientation of these on the following lines seems to be warranted :

(a) raising of green manure plants such as Glyrecidia exclusively on field bunds so as to provide sufficient green leaf at least during one crop season;

(b) evolving of quick growing species which can produce enough green matter in about 6 to 8 weeks; and

(c) introduction of dual purpose crops such as the leguminous varieties which yield both grains and green manure.

The other important local manurial resource is night soil which has to be tackled on scientific lines. A pilot experiment of night soil preservation on proper hygienic methods is worth a serious trial all over the country. With regard to tank silt there is scope to link up the programme of desilting of tanks with the schemes relating to local manures, so that the twin objectives of proper maintenance of irrigation tanks as well as utilisation of silt as manure are achieved at minimum costs.

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सत्यमेव जयते

TABLE No. 1·1

List of selected Districts and Blocks

State	Name of the district	Whether Package/ Non-package	Names of the Blocks with	
			Maximum consumption of fertilisers.	Minimum consumption of fertilisers.
1	2	3	4	5
1. Andhra Pradesh	West Godavari	Package	Narsapuram	Pentapadu
	Chittoor	Non-package	Nagari	Chandragiri
	Karimnagar	Do.	B.D. Palli	Husnabad
2. Assam	Cachar	Package	Lala	Lakhipur
	Golpara	Non-package	Choparasalkocha	Matia
3. Bihar	Shahabad	Package	Dehri	Kargahar
	Muzaffarpur	Non-package	Muraul	Sursand
4. Gujarat	Surat	Package	Gandevi	Mahuva
	Bhavnagar	Non-package	Gadhada	Botad
5. J. & K.	Anantnag	Package	Quomoy	..
6. Kerala	Alleppey	Package	Valianad	Mallapally
	Trichur	Non-package	Chalakudy	Vellangellur
7. Madhya Pradesh . . .	Raipur	Package	Abhanpur	Kurud
	Balaghat	Non-package	Khairlangi	Katangi
	Chattarpur	Do.	Nowgong	Baremahahra
	Mandsaur	Do.	Neemuch	Mansa
8. Madras	Thanjavur	Package	Orthanad	Sirkali
	South Arcot	Non-package	Kurinjipadi	Portonovo
9. Maharashtra	Bhandara	Package	Tumsar	Tirora
	Kolaba	Non-package	Panvel	Roha
	Yeotmal	Do.	Datwaha	Babhulgaon
10. Mysore	Mandya	Package	Mandya	K. R. Pet
	Raichur	Non-package	Gangavati	Sindhanoor
	South Kanara	Do.	Mangalore	Puthur

11. Orissa	Sambalpur	Package	Bargharh	Rengali
	Cuttack	Non-package	Mahanga	Dasarthpur
12. Punjab	Ludhiana	Package	Samrala	Jagraon
	Hissar	Non-package	Narnaud	Hissar I
13. Rajasthan	Pali	Package	Sumerpur	Kharchi
	Chittorgarh	Non-package	Chittorgarh	Rashmi
	Ganganagar	Do.	Raisingpur	Sadalshahar
14. Uttar Pradesh	Aligarh	Package	Jawan	Sikandraro
	Azamgarh	Non-package	Ghosi	Rani-ki-Sarai
	Jhansi	Do.	Baliha	Jakhaura
	Muzaffernagar	Do.	Khairana	Baghara
15. West Bengal	Burdwan	Package	Memari	Asgram
	Cooch-Behar	Non-package	Dinhata	Tuffanganj
16. Himachal Pradesh . . .	Sirmur	Non-package	Paonta	Nahan

TABLE No. 1·2

Particulars of land-use pattern in Package and Non-package (selected) districts for the year 1961-62

State	District (P for package)	Total geographical area (hectares)	Land use area as % to geographical area in the district							
			Forest	Area not available for cultivation.	Other uncultivated land excluding fallow land	Fallow land other than current fallow	Net sown area	Net cultivated area	Gross cropped area	Gross irrigated cropped area
1	2	3	4	5	6	7	8	9	10	11
1. Andhra Pradesh .	W. Godavari (P)	770,078·26	10·36	11·92	18·56	1·08	54·74	58·08	69·12	51·85
	Chittoor	138,000·80	22·60	22·27	11·34	4·26	27·79	39·53	30·88	11·68
	Karimnagar	1,174,732·00	20·90	7·49	15·61	1·96	49·02	54·04	44·62	13·50
2. Assam . .	Cachar (P)	762,538·34	40·79	8·16	16·23	3·96	27·26	30·86	33·73	2·84
	Goalpara	1,020,672·00	23·40	6·11	33·72	11·76	24·27	25·00	30·53	..
3. Bihar . .	Shahabad (P)	1,128,012·90	23·60	8·81	2·34	1·65	58·61	63·55	102·08	43·02
	Muzafferpur	773,120·00	..	12·00	3·82	..	67·99	84·18	92·48	3·85
4. Gujarat .	Surat (P)	1,142,957·00	11·83	11·24	10·49	1·27	64·36	65·17	69·78	2·96
	Bhavnagar	908,858·00	1·06	11·40	15·77	2·47	66·96	69·30	67·97	74·41
5. J. & K.. .	Anantnag (P)	220,211·00	0·52	19·47	15·89	0·36	60·45	63·76	63·88	40·15
6. Kerala . .	Alleppey (P)	188,760·80	0·27	7·06	4·10	0·50	84·96	88·67	118·33	N.A.
	Trichur	294,265·07	45·17	4·34	1·72	4·38	42·82	44·39	66·89	19·43
7. M.P. . .	Raipur (P)	1,450,303·00	9·24	9·25	16·31	2·36	60·08	62·84	81·91	10·21
	Balaghat	910,195·00	45·92	9·80	12·89	1·57	28·68	29·82	40·61	9·72
	Chattarpur	2,131,407·00	5·56	17·22	32·87	11·83	28·06	32·72	31·24	5·19
	Mandsaur	934,466·00	8·80	12·45	38·03	0·55	39·69	40·17	47·49	4·91
8. Madras .	Thanjavur (P)	968,262·10	1·33	20·51	9·19	3·43	62·83	65·54	80·58	62·16
	S. Arcot	1,090,733·00	5·89	9·04	14·79	10·36	56·12	59·92	65·50	30·69
9. Maharashtra	Bhandara (P)	936,050·09	27·57	9·88	18·75	1·49	41·45	42·31	56·73	13·37
	Kolaba	686,862·00	24·08	17·85	16·26	6·81	31·31	35·00	33·00	0·45
	Yeotmal	1,351,959·21	22·64	8·68	6·94	4·39	55·29	57·35	55·70	0·23

10. Mysore .	Mandya (P) .	470,572 ·00	3 ·56	10 ·56	26 ·11	0 ·29	52 ·95	59 ·43	59 ·84	22 ·01
	Raichur	1,374,331 ·20	0 ·94	7 ·76	8 ·63	1 ·17	73 ·30	82 ·50	75 ·35	5 ·50
	S. Kanara	814,322 ·44	26 ·58	16 ·57	28 ·50	4 ·89	22 ·03	23 ·52	30 ·26	26 ·75
11. Orissa . .	Sambalpur (P)	1,753,000 ·00	12 ·17	11 ·41	26 ·10	16 ·34	48 ·55	42 ·01	52 ·47	12 ·03
	Cuttack	1,086,200 ·00	7 ·79	15 ·24	10 ·35	..	57 ·23	66 ·62	65 ·73	12 ·38
12. Punjab .	Ludhiana (P)	342,654 ·26	0 ·39	10 ·61	5 ·86	0 ·28	80 ·03	82 ·86	100 ·70	61 ·55
	Hissar	1,389,341 ·58	0 ·01	9 ·46	0 ·20	..	85 ·05	90 ·33	104 ·70	N.A.
13. Rajasthan .	Pali (P)	1,222,380 ·00	5 ·22	16 ·97	8 ·52	13 ·83	45 ·68	55 ·46	48 ·43	11 ·80
	Chittorgarh	999,153 ·00	4 ·07	22 ·43	40 ·74	3 ·39	28 ·26	29 ·37	36 ·69	8 ·17
	Ganganagar	2,064,753 ·00	0 ·14	3 ·70	27 ·19	3 ·19	60 ·30	65 ·78	63 ·03	19 ·74
14. U.P. . .	Aligarh (P)	498,623 ·20	0 ·21	14 ·02	3 ·89	4 ·28	77 ·55	77 ·60	105 ·62	47 ·82
	Azamgarh	574,565 ·49	0 ·70	13 ·39	4 ·37	0 ·36	77 ·55	81 ·18	97 ·18	38 ·78
	Muzaffernagar	416,130 ·00	0 ·23	6 ·80	11 ·59	0 ·30	77 ·79	81 ·08	103 ·01	54 ·52
	Jhansi	979,941 ·93	6 ·09	10 ·72	26 ·42	2 ·84	44 ·62	53 ·93	47 ·41	5 ·04
15. W. Bengal .	Burdwan (P)	695,397 ·60	6 ·00	14 ·67	6 ·92	0 ·87	67 ·85	71 ·54	73 ·73	36 ·47
	Cooch-Behar	333,230 ·00	..	13 ·65	N.A.	8 ·20	77 ·42	78 ·15	93 ·21	3 ·84
16. H.P. . .	Sirmur	222,131 ·60	22 ·07	2 ·84	56 ·10	0 ·20	18 ·03	18 ·79	30 ·31	7 ·28

NOTE :—Package districts have been differentiated with (P).

TABLE No. 1·2—*contd.*

Particulars of land-use pattern in Package and Non-package (selected) districts for the year 1961-62

State	District (P for package)	Total geographical area (hectares)	Area as % to net cultivated area in the district		Intensity of cultivation
			Current fallow	Net sown area	
1	2	3	12	13	14
1. Andhra Pradesh	W. Godavari (P)	770,078·26	5·95	94·25	119·01
	Chittoor	138,000·80	27·06	70·31	78·12
	Karimnagar	1,174,732·00	22·25	77·75	82·56
3. Assam	Cachar (P)	762,538·34	11·68	88·32	109·27
	Goalpara	1,020,672·00	2·83	97·17	122·13
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	Muzaffarpur	773,120·00	19·24	80·76	109·85
4. Gujarat	Surat (P)	1,142,957·00	1·24	98·83	107·07
	Bhavnagar	908,858·00	3·36	96·64	98·09
5. J. & K.	Anantnag (P)	220,211·00	5·19	94·81	100·19
6. Kerala	Alleppey (P)	188,760·80	3·53	96·47	137·90
	Trichur	294,265·07	3·54	96·46	150·70
7. M.P.	Raipur (P)	1,450,303·00	4·39	95·61	130·35
	Balaghat	910,195·00	3·83	96·17	136·16
	Chattarpur	2,131,407·00	14·25	85·75	95·47
	Mandsaur	934,466·00	1·19	98·81	118·23
8. Madras	Thanjavur (P)	968,262·10	4·12	95·88	122·96
	S. Arcot	1,090,733·00	6·36	93·64	109·29
9. Maharashtra	Bhandara (P)	936,050·09	2·03	97·97	34·06
	Kolaba	686,862·00	10·57	89·43	4·26
	Yeotmal	1,351,959·21	3·61	96·39	97·12
10. Mysore	Mandya (P)	470,572·00	10·96	89·04	100·62
	Raichur	1,374,331·20	8·73	91·27	91·33
	S. Kanara	814,322·44	6·32	93·68	128·63

11.	Orissa	Sambalpur (P)	1.753,000 ·00	0 ·24	99 ·76	107 ·80
		Cuttack	1.086,200 ·00	14 ·09	85 ·91	98 ·69
12.	Punjab	Ludhiana (P)	342,654 ·26	3 ·41	96 ·59	121 ·54
		Hissar	1,389,341 ·58	5 ·85	94 ·15	115 ·91
13.	Rajasthan	Pali (P)	1,222,380 ·00	17 ·63	82 ·37	87 ·33
		Chittorgarh	999,153 ·00	3 ·79	96 ·21	124 ·90
		Ganganagar	2,064,753 ·00	8 ·33	91 ·67	95 ·83
14.	U.P.	Aligarh (P)	498,623 ·20	0 ·06	99 ·94	136 ·10
		Azamgarh	574,565 ·49	4 ·53	95 ·47	119 ·70
		Jhansi	979,941 ·93	17 ·26	82 ·74	87 ·91
		Muzaffernagar	416,130 ·00	4 ·06	95 ·94	127 ·05
15.	W. Bengal	Burdwan (P)	695,397 ·60	5 ·16	94 ·84	103 ·06
		Cooch-Behar	333,230 ·60	0 ·93	99 ·07	119 ·27
16.	H. P.	Sirmur	222,131 ·60	4 ·01	95 ·99	161 ·34

TABLE NO. 1·3

Cropping pattern in 1961-62 in the selected Districts

State	District (P for package)	Gross cropped area (hectares)	Crop area as % to gross cropped area, crop-wise						
			Paddy	Wheat	Millets*	Sugarcane	Cotton	Ground-nut	Tobacco
1	2	3	4	5	6	7	8	9	10
1. Andhra Pradesh .	W Godavari (P)	532,128·68	70·57	..	3·06	2·31	..	3·44	2·53
	Chittoor	426,118·40	26·54	..	25·71	2·39	..	24·30	0·30
	Karimnagar	524,136·00	27·37	..	36·33	..	0·09	1·47	..
2. Assam . . .	Cachar (P)	257,170·78	78·43	..	..	1·38	..	..	0·25
	Goalpara	267,286·40	87·31	..	..	..	..	..	..
3. Bihar . . .	Shahabad (P)	1,151,519·70	42·37	8·52	3·62	1·06	..	..	..
	Muzaffarpur	714,933·14	41·14	4·79	16·56	3·05	..	..	0·76
4. Gujarat . . .	Surat (P)	797,550·00	16·95	1·46	13·74	0·57	19·15	5·60	..
	Bhavnagar	617,814·00	0·51	5·63	38·50	0·79	4·53	38·03	..
5. J. & K. . . .	Anantnag (P)	140,661·00	50·13	4·74	26·93	..	0·04	..	0·05
6. Kerala . . .	Alleppey (P)	229,229·60	38·55	..	..	2·36	..	..	..
	Trichur	196,840·41	51·92	..	..	..	..	..	..
7. M. P. . . .	Raipur (P)	1,187,966·00	58·75	..	..	..	..	..	..
	Balaghat	369,592·00	57·61	3·77	0·16	..	..	..	..
	Chattarpur	665,788·00	6·94	20·49	7·16	0·33	..	..	..
	Mandsaur	443,798·00	..	11·33	44·15	0·36	4·48	11·50	..
8. Madras . . .	Thanjvur (P)	780,220·00	76·62	..	1·03	0·50	0·01	2·59	0·09
	S. Arcot	714,390·00	40·26	..	15·98	1·41	0·28	20·21	0·41
9. Maharashtra . .	Bhandara (P)	530,981·57	50·56	6·34	..	..	..	..	..
	Kolaba	226,639·00	59·23	..	12·74	0·01	..	..	..
	Yeotmal	753,366·06	..	3·16	33·72	0·04	40·94	..	..
10. Mysore	Mandya (P)	281,590·00	22·24	..	32·48	4·45	..	4·47	0·25
	Raichur	1,035,624·80	1·63	..	38·07	0·64	25·36	10·74	..
	S. Kanara	246,376·00	81·20	..	0·69	1·14	..	..	..
11. Orissa . . .	Sambalpur (P)	919,728·00	88·99	0·09	0·05	0·39	..	0·51	..
	Cuttack	713,973·08	68·42	0·23	8·79	0·49	..	0·39	0·10

12. **Punjab** . . .	Ludhiana (P)	345,052·86	..	33·50	11·53	2·95	8·64	8·34	..
	Hissar	1,454,577·19	1·09	9·23	24·49	0·81	3·61	..	0·02
13. Rajasthan . . .	Pali (P)	592,011·80	..	14·22	48·19	..	1·51	0·21	0·02
	Chittorgarh	366,573·06	..	15·16	35·35	..	7·76	6·90	..
	Ganganagar	1,301,489·00	..	7·10	5·56	0·42	5·86	..	..
14. U.P. . . .	Aligarh (P)	526,626·80	1·08	15·34	24·94	6·08	2·40	0·21	0·09
	Azamgarh	558,335·36	35·19	2·56	20·93	6·73	..	..	..
	Jhansi	464,572·20	3·74	12·12	12·68	..	..	..	..
	Muzaffarnagar	428,669·00	7·80	27·63	4·58	27·22	..	..	..
15. **West Bengal** . .	Burdwan (P)	512,687·20	86·64	0·38	00·25	0·61	..	..	..
	Cooch-Behar	310,600·00	59·57	0·44	1·67	..	..	..	3·85
16. H.P. . . .	Sirmur	67,326·80	8·25	34·69	34·89	1·54	..	..	..

*It includes areas under Jowar, bajra, maize, barley and ragi only.

TABLE No. 1·3—*contd.*

Cropping Pattern in 1961-62 *in the Selected Districts.*

State	District (P for package)	Gross cropped area (hectares)	Crop area as % to gross cropped area, crop-wise				
			Coconut	Chillies	Vegetables	G.M. crops	Misc. crops.
1	2	3	11	12	13	14	15
1. Andhra Pradesh	W. Godavari (P)	532,328·68	0·80	0·73	0·56	2·18	13·82
	Chittoor	426,118·40	0·19	0·77	0·32	0·26	19·22
	Karimnagar	524,136·00	..	..	0·10	..	34·64
2. Assam	Cachar (P)	257,170·78	..	0·39	1·19	..	18·36
	Goalpara	267,286·40	..	..	1·98	..	10·71
3. Bihar	Shahabad (P)	1,151,519·70	..	..	0·63	..	43·80
	Muzaffarpur	714,933·14	..	0·70	1·57	..	31·43
4. Gujarat	Surat (P)	797,550·00	..	..	1·14	..	41·39
	Bhavnagar	617,814·00	..	1·17	0·43	..	10·41
5. J. & K.	Anantnag (P)	140,661·00	..	0·30	2·58	..	15·23
6. Kerala	Alleppey (P)	229,229·60	..	..	20·37	..	38·72
	Trichur	196,840·41	18·28	..	0·78	..	29·02
7. M. P.	Raipur (P)	1,187,966·00	..	..	0·64	..	40·61
	Balaghat	369,592·00	..	..	0·59	0·04	37·83
	Chattarpur	665,788·00	..	..	0·31	0·50	64·27
	Mandsaur	443,798·00	..	0·35	0·11	0·46	27·26
8. Madras	Thanjavur (P)	780,220·00	1·89	0·23	0·17	5·49	11·38
	S. Arcot	714,390·00	0·19	0·14	0·03	..	21·09
9. Maharashtra	Bhandara (P)	530,981·57	..	..	1·23	..	41·87
	Kolaba	226,639·00	0·33	0·26	0·50	..	26·93
	Yeotmal	753,366·06	..	..	0·30	..	21·84
10. Mysore	Mandya (P)	281,590·00	1·51	0·53	0·37	5·68	28·02
	Raichur	1,035,624·80	..	..	0·04	..	23·52
	S. Kanara	246,376·00	4·73	1·40	1·49	..	9·35
11. Orissa	Sambalpur (P)	919,728·00	..	..	2·23	2·46	5·28
	Cuttack	713,973·08	..	..	2·48	..	19·10

12. Punjab	Ludhiana (P)	345,052·86	..	..	0·51	..	34·53
	Hissar	1,454,577·19	..	0·06	0·18	..	60·51
13. Rajasthan	Pali (P)	592,011·80	..	0·45	0·16	..	35·24
	Chittorgarh	366,573·06	..	..	0·05	0·22	34·56
	Ganganagar	1,301,489·00	..	..	0·10	0·06	80·90
14. U.P.	Aligarh (P)	526,626·80	..	..	0·60	..	49·26
	Azamgarh	558,335·36	..	..	0·82	..	33·77
	Jhansi	464,572·20	..	..	0·05	0·12	71·29
	Muzaffarnagar	428,669·00	..	0·21	0·43	..	32·13
15. West Bengal	Burdwan (P)	512,687·20	..	..	2·29	..	9·83
	Cooch-Behar	310,600·00	..	..	2·52	0·13	31·82
16. H.P.	Sirmur	67,326·80	..	..	2·00	..	18·63

TABLE NO. 2·1

Statement showing the progress made in setting up Soil Testing Laboratories over the plan periods

Sl. No.	Name of the State	Pre-Plan		First Plan		Second Plan		Third Plan	
								Targets	
		No.	Llocation	No.	Location	No.	Location	No.	Location
1	2	3	4	5	6	7	8	9	10
1.	**Andhra Pradesh** . . .	Nil	..	Nil	..	3	1. Rajender Nagar (Hyderabad). 2. Bapaths 3. Rajmahendry	1	Tadepaligudem
2.	**Kerala**	Nil	..	Nil	..	1	Trivandrum	1	Palghat
3.	**Madras**	Nil	..	Nil	.	2	1. Coimbatore 2. Aduthurai	1	Koilpatti
4.	**Maharashtra** . . .	Nil	..	Nil	..	2	1. Poona 2. Nagpur	Nil	
5.	**Mysore**	Nil	..	Nil	..	2	1. Hebbal (Bangalore). 2. Bale Honnur	Nil	
6.	**Gujarat**	Nil	..	Nil	..	1	Junagadh	1	Bardoli
7.	**Assam**	Nil	..	Nil	..	1	Jorhat	1	Silchar
8.	**Orissa**	Nil	..	Nil	..	2	1. Bhuvaneswar 2. Sambalpur	3	1. Agrl. College. Bhuvaneswar 2. Balapur 3. Dhenkanur
9.	**West Bengal** . . .	Nil	..	Nil	..	1	Calcutta	2	1. Burdwan 2. Malres.
10.	**Bihar**	Nil	..	2	1. Salar 2. Patna	2	1. Pusa 2. Hazaribagh	3	1. Salastra 2. Champaran 3. Shahabad
11.	**Madhya Pradesh** . . .	Nil	..	Nil	..	2	1. Gwalior 2. Jabalpur	1	Raipur
12.	**Uttar Pradesh** . . .	10	N.A.	Nil	..	6	N.A.	14	N.A.
13.	**Himachal Pradesh** . .	Nil	..	1	Simla	Nil	..	1	Mandi
14.	**Punjab**	Nil	..	Nil	..	2	1. Karnal 2. Ludhiana	3	1. Palampur 2. Hissar 3. Gurgaon
15.	**Rajasthan**	Nil	..	Nil	..	2	1. Jodhpur 2. Udaipur	3	1. Kotah 2. Ganganagar 3. Jaipur
	TOTAL . .	10	..	3	..	29		35	

TABLE NO. 2·1—*contd.*

Sl. No.	Name of the State	Third Plan Achievement No.	Third Plan Achievement Location	Total	Remarks
1	2	11	12	13	14
1.	Andhra Pradesh	1	T.P. Gudem	4	
2.	Kerala	Nil	..	2	
3.	Madras	1	Koilpatti	3	
4.	Maharashtra	..	..	2	
5.	Mysore	..	..	2	
6.	Gujarat	1	Bardoli	2	
7.	Assam	Nil	..	2	
8.	Orissa	1	Agri. College Bhuvaneswar	5	
9.	West Bengal	Nil	..	3	
10.	Bihar	3	1. Salastra 2. Champaran 3. Shahabad	7	
11.	Madhya Pradesh	1	Raipur	3	For the soil testing laboratories in this state details on location were not furnished hence, these are not included in the total.
12.	Uttar Pradesh	2	N.A.	..	
13.	Himachal Pradesh	Nil	..	2	
14.	Punjab	1	N.A.	5	
15.	Rajasthan	1	N.A.	5	
	TOTAL	12		47	

TABLE NO. 2.2

Distribution of sample villages according to effect of the use of Fertilisers on Soils, Yield of crops etc.*

effect on soils			On yield of crop			On plant growth			On Pests/diseases			
Response	No. of villages reporting	% to total	Response	No. of villages reporting	% to total	Response	No. of villages reporting	% to total	Response	No. of villages reporting	% to total	Remarks
1	2	3	4	5	6	7	8	9	10	11	12	13
1. Results in depletion of soil fertility if used continuously.	84	25·5	1. Yield has increased.	114	32·6	1. Facilitates better growth of plant.	196	55·2	1. Use of fertilisers reduces the incidence of pests/diseases.	41	12·0	
2. Increases acidity in soils/ hardens soils.	42	12·7	2. Should be used without break if yields is to be maintained.	63	18·0	2. Leads to lodging if judicious dosage is not used.	33	9·3	2. Increases the incidence because of luxurious growth of plants.	53	15·6	
3. No depletion in fertility if used with organic manures.	60	18·2	3. Yield increases if used with organic manures.	45	12·8	3. Plant growth will be better only under irrigated conditions.	12	3·3	3. There is no particular relationship between fertiliser use and plant diseases.	139	41·0	

4. No adverse effects on soils.	76	23·0	No perceptible effect on yield/decrease.	61	17·4	Better vegetable growth but less of yield.	25	7·0	4. No New pests/diseases occurring because of fertiliser use.	63	18 .6
5. No experience of using fertiliser continuously.	68	20·6	5. No experience in using fertilisers continuously.	67	19·1	Plant growth is affected.	9	2·5	5. No experience using fertilisers continuously.	43	12·7
						6. No experience in using fertilisers continuously.	80	22·5			
TOTAL ..	330	100·0	TOTAL ..	350	99·9	TOTAL ..	355	99·8	TOTAL ..	339	99·9

*Tabulated on the basis of data collected at the village level by consensus method.

TABLE No. 4.1

Particulars of allocation and achievement of Nitrogenous fertilisers during Second Plan Period and first two years of Third Plan Period

[In terms of 'N' / Quantity in M. T.]

Sl. No.	State	Second Plan			1961-62			1962-63			Remarks
		Allocation (% to col. 4)	Demand	Achievement (% to col. 7)	Allocation % to col. 7)	Demand	Achievement (% to col. 7)	Allocation % to col. 10)	Demand	Achievement (% to col. 10)	
1	2	3	4	5	6	7	8	9	10	11	12
1.	A. P. .	1,31,154·84 (63·88)	2,05,310·93	1,16,699·82 (56·84)	4,663·43* (7·00)	66,641·00	37,893·29 (56·86)	98,943·86 (120·01)	82,400·00	59,138·27 (71·77)	*Besides this a quantity of 2,678 has been received exclusively for Programme in West Godavari district.
2.	Assam .	Not mentioned	7,210·00	332·90 (4·62)	Not mentioned	3,090·00	182·10 (5·89)	Not mentioned	5,150·00	189·73 (3·68)	
3.	Bihar .	49,045·96 (52·66)	93,141·25	38,550·20 (41·39)	14,735·10 (70·39)	20,933·00	12,466·98 (59·86)	23,704·60 (101·28)	23,405·00	14,673·32 (62·69)	
4.	Gujarat .	7,403·52 (111·51)	6,639·38	25,429·39 (383·01)	12,961·30 (234·34)	5,531·05	8,717·34 (157·61)	15,484·75 (233·86)	6,621·50	11,263·27 (170·10)	
5.	H. P. .	532·85 (254·57)	209·31	345·99 (165·30)	249·87 (99·48)	251·17	191·15 (76·10)	262·39 (83·57)	313·96	218·89 (69·72)	
6.	Kerala .	11,339·29	..	16,505·55	8,967·23 (75·09)	11,941·79	6,527·50 (54·66)	10,475·27 (71·41)	14,669·92	5,599·31 (38·17)	

7. M. P.	32,500·53 (69·26)	46,925·98	22,193·41 (47·29)	7,449·30 (70·50)	10,566·00	6,334·62 (59·95)	13,765·50 (91·54)	15,038·00	7,624·90 (50·70)
8. Madras .	1,33,054·16 (65·61)	2,02,807·00	1,29,012·44 (63·61)	38,926·58 (65·33)	59,585·50	34,159·54 (57·33)	66,062·55 (90·02)	73,387·50	49,860·65 (67·94)
9. Maharashtra .	91,906·75 (50·01)	1,83,789·70	89,041·39 (48·45)	36,046·20 (49·39)	72,986·43	32,721·40 (44·83)	46,897·28 (57·39)	81,710·00	31,038·32 (37·99)
10. Mysore .	48,944·26 (56·55)	86,545·50	41,121·04 (47·51)	24,099·00 (61·73)	39,040·15	13,146·04 (33·67)	24,650·37 (70·38)	35,025·00	16,614·00 (47·43)
11. Orissa	N. A.	33,990·00	18,584·50 (54·68)	8,250·30 (40·05)	20,600·00	4,521·49 (21·95)	10,300·00 (40·00)	25,750·00	3,337·61 (12·96)
12. Punjab	25,100·30 (65·33)	38,419·00	32,034·01 (83·38)	16,481·80 (100·01)	16,480·00	12,999·94 (78·88)	32,777·50 (122·40)	26,780·00	21,558·41 (80·50)
13. Rajasthan	7,594·40 (226·77)	3,348·94	6,342·33 (189·38)	2,712·00 (52·08)	5,207·21	2,917·10 (56·02)	4,832·02 (58·00)	8,331·61	3,557·69 (42·70)
14. U. P.	1,64,318·66 (52·52)	3,12,871·80	121,591·40 (38·86)	39,039·34 (64·50)	60,526·30	29,800·47 (49·24)	43,856·21 (48·38)	90,646·00	N.A. . .
15. West Bengal	36,841·78 (91·30)	40,354·00 . .	33,580·60 (83·22)	19,649·40 (75·00)	26,198·00 . .	11,778·54 (44·96)	14,374·35 (52·89)	27,179·00 . .	5.295·55 (19·48)

NOTE : (*i*) Pool fertilisers only have been taken into consideration.

(*ii*) Achievement is arrived at as follows :
Opening stock at the beginning of the year.
Stock received during the year.
Stock existing at the end of the year.

TABLE NO. 4.2

Particulars of respondents in selected package districts reporting farm production plans

Year	Total No. of sample respondents	No. of respondents participating in package programme	No. reporting Production Plans for various items as also following the same											
			Fertiliser Compost, Green Manure & Credit		Fertiliser Compost & Credit		Fertiliser Compost & Green Manure		Fertiliser & Green Manure		Fertiliser only		Fertiliser and Credit	
			No. having Production Plans	No. following	No. having Production Plans	No. follow ing	No. having Production Plans	No. following	No. having Production Plans	No. following	No. having Production Plans	No. following	No. having Production Plans	No. following
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1961-62 . . .	1,102	319	132	76	50	28	83	76	11	9	35	15	9	Nil
1962-63 . . .	1,308	423	134	79	59	27	91	86	2	Nil	37	9	100	55

TABLE No. 4.3

Statement showing average quantities of inputs and credit per cultivator during 1961-62 *and* 1962-63

Year	Crop	No. having Production Plans	'N' type of Fertilisers (in Kgs.)		'K' type (Kgs.)		'K' type (Kgs.)		Compost (Quintals)		Green Manure (Area in Hectares)		Credit (in Rs.)	
			Planned	Used	Planned	Used	Planned	Used	Planned	Produced	Area Panned	Area Grown	To be made available	Actual availed
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1961-62	1. Paddy .	298	171·0	106·0	159·0	75·0	1·4	1·1	44·0	34·0	6·3	0·77	76·2	65·3
	2. Wheat .	29	267·0	177·0	191·0	50·0	6·2	Nil	9·3	2·1	Nil	Nil	128·4	114·2
1962-63	1. Paddy .	333	203·0	125·0	213·0	107·0	9·6	20·0	69·2	38·0	4·7	3·3	282·4	156·2
	2. Wheat	68	243·0	334·0	243·0	77·0	1·6	1·3	5·0	2·3	Nil	Nil	211·0	107·3

TABLE No. 5.1

Particulars of distribution points, in selected districts, during the last year of the First and Second Plans and first two years of the Third Plan

State	District (P for package)	No. of distribution points in							
		First Plan		Second Plan		1961-62		1962-63	
		Co-op.	Total	Co-op.	Total	Co-op.	Total	Co-op.	Total
1	2	3	4	5	6	7	8	9	10
1. Andhra Pradesh	W. Godavari (P)	..	19	170	170	248	257	263	272
	Chittoor .	6	21	80	95	150	205	200	286
	Karimnagar	..	20	..	32	57	89	163	195
2. Assam . .	Cachar (P)	..	45	..	185	NA	NA	NA	NA
	Goalpara	..	114	..	194	..	194	..	194
3. Bihar . .	Shahabad (P)	6	6	17	17	17	17	17	17
	Muzaffarpur	9	9	46	46	46	46	18	18
4. Gujarat . .	Surat (P)	..	18	151	151	152	152	179	179
	Bhavnagar	..	NA	133	173	133	133	133	133
5. J. & K. . .	Anantnag (P)	NA	NA	187	187	235	235	235	235
6. Kerala . .	Alleppey (P)	NA	NA	..	150	NA	NA	NA	NA
	Trichur	..	12	..	85	..	75	..	119
7. M. P. . .	Raipur (P)	..	35	70	70	121	121	194	194
	Balaghat	NA	NA	59	59	78	78	84	84
	Chattarpur	..	15	30	34	87	87	87	87
	Mandsaur	..	8	..	42	42	42	83	83
8. Madras .	Thanjavur	NA	NA	NA	NA	NA	NA	NA	NA
	S. Arcot	NA	NA	184	184	257	671	261	756
9. Maharashtra .	Bhandara (P)	80	80	107	107	107	107	107	107
	Kolaba	..	17	144	144	288	288	308	308
	Yeotmal	6	12	6	6	14	14	14	14
10. Mysore . .	Mandya (P)	NA	NA	7	10	386	386	386	386
	Raichur	NA	NA	NA	NA	37	37	26	26
	S. Kanara	7	7	42	42	142	142	170	170

11.	Orissa .	. Sambalpur (P)	NA	NA	NA	NA	58	58	58
		Cuttack	NA	NA	NA	230	228	228	230
12.	Punjab .	. Ludhiana (P)	42	42	240	240	288	288	300
		Hissar	NA	143	NA	192	141	141	169
13.	Rajasthan	. Pali (P)	NA	NA	NA	NA	529	529	563
		Chittorgarh	..	19	..	30	NA	NA	NA
		Ganganagar	NA	NA	NA	NA	NA	133	NA
14.	U. P.	Aligarh (P)	39	45	40	57	40	153	40
		Azamgarh	56	62	60	95	509	539	704
		Jhansi†	5	11	32	45	42	66	42
		Muzaffarnagar	5	5	2	12	128‡	128‡	128‡
15.	W. Bengal	Burdwan (P)	NA	NA	..	770	..	770	..
		Cooch-Behar	..	106	..	159	6	54	6
16.	H. P.	Sirmur	NA	NA	NA	NA	..	40	..
		TOTAL . .	261	871	1,806	4,013	4,566	6,504	5,168

†It excludes subsidiary sale points.

‡It includes sub-depots.

*It includes 40 private depots exclusively for SP.

TABLE NO. 5.2

Percentage distribution of respondents, in selected districts, according to the source of supply during the year 1961-62 *and* 1962-63

State	District (Package —P and Non-package —NP)	Total No. of respondents in the districts	% availing the source of supply, agency wise							
			Cooperatives		Private		Governmental agencies		Other sources	
			1961-62	1962-63	1961-62	1962-63	1961-62	1962-63	1961-62	1962-63
1	2	3	4	5	6	7	8	9	10	11
1. Andhra Pradesh	P	104	58·0	60·2	41·3	36·7	—	..	0·7	3·1
	NP	231	51·9	48·0	38·3	36·9	9·2	11·6	0·6	3·5
2. Assam	P	130	..	20·0	..	..	100·0	80·0	..	..
	NP	137	..	..	..	..	100·0	100·0	..	..
2. Bihar	P	100	100·0	94·6	..	..	..	..	..	5·4
	NP	140	34·5	39·4	..	..	44·9	42·5	20·6	18·1
4. Gujarat	P	100	92·8	90·9	7·2	6·1	..	..	..	3·0
	NP	100	96·3	93·7	..	..	3·7	6·3	..	..
5. J. & K.	P	68	100·0	93·7	..	..	..	4·2	..	2·1
6. Kerala	P	101	41·3	57·4	50·0	33·7	..	1·1	8·7	7·8
	NP	100	..	5·3	69·7	89·5	3·3	2·6	..	2·6
7. M. P.	P	113	95·9	91·4	..	..	..	..	4·1	8·6
	NP	351	52.4	47·9	..	1·0	34·9	39·4	12·7	11·7
8. Maharashtra	P	106	100·0	100·0	..	..	..	..	..	..
	NP	218	24·1	29·6	75·9	68·8	..	..	..	1·6
9. Madras	P	118	89·5	89·3	2·7	7·2	2·6	..	5·2	3·5
	NP	100	60·0	60·7	30·0	30·3	..	..	10·0	9·0
10. Mysore	P	130	93·6	94·5	6·4	5·5	..	..	..	..
	NP	276	65·0	63·7	29·0	30·7	1·2	..	4·8	5·4
11. Orissa	P	102	71·5	87·6	28·5	4·1	..	8·3	..	..
	NP	136	50·0	58·1	38·0	30·7	8·6	8·0	3·4	3·2

12. Punjab	P	120	98·7	100·0	..	..	..	..	1·3	..
	NP	132	100·0	83·9	..	..	..	..	..	16·1
13. Rajasthan	P	108	100·0	93·8	..	..	..	6·2	..	..
	NP	215	45·1	57·7	54·9	37·2	..	1·7	..	3·3
14. U. P.	P	106	18·5	26·1	13·1	8·7	50·0	56·6	18·4	8·6
	NP	325	88·9	85·9	1·5	0·7	2·9	6·7	6·7	6·7
15. West Bengal	P	138	13·3	11·6	76·1	78·2	..	..	10·6	10·2
	NP	140	..	6·6	100·0	93·4	..	..	..	..
16. Himachal Pradesh	NP	120	..	..	41·1	26·0	58·9	74·0	..	..
All India	P	1,652	73·4	75·1	20·1	17·2	3·1	4·0	3·4	3·7
	NP	2,721	56·8	60·0	29·0	26·5	9·9	11·9	4·3	5·6
All India total (irrespective of package and non-package)		4,373	65·1	65·4	24·5	21·9	6·6	8·1	3·8	4·6

TABLE No. 5·3

Percentage share in sales of fertilisers by agencies type-wise during 1961-62 *and* 1962-63

State	District (P—Package NP—Non-package)	% of fertilisers distributed, agency-wise and year-wise											
		Cooperative						Private					
		1961-62			1962-63			1961-62			1962-63		
		N	P	Grades	N	P	Grades	N	P	Grades	N	P	Grades
1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Andhra Pradesh .	P	88·6	2·6	1·4	84·7	3·5	35·1	11·4	97·4	98·6	13·1	96·5	64·9
	NP	46·7	12·8	..	45·0	18·0	..	32·2	77·9	15·1	31·4	69·2	3·8
2. Assam . . .	P	..	..	..	..	..	22·5	..	..	..	..	..	..
	NP	..	..	..	..	..	..	..	..	..	..	..	..
3. Bihar . . .	P	100·0	100·0	100·0	96·5	100·0	100·0	..	..	..	..	..	..
	NP	34·2	30·9	..	30·3	32·0	..	..	..	..	..	..	..
4. Gujarat .	P	37·4	29·2	..	19·5	57·0	..	62·6	70·8	..	78·6	34·9	..
	NP	100·0	96·9	..	100·0	97·5	100·0	..	..	..	..	..	..
5. J. & K. . .	P	100·0	..	..	97·3	..	..	..	..	..	..	..	..
6. Kerala . . .	P	54·7	92·9	66·5	91·5	93·7	74·5	42·2	7·0	29·6	5·9	2·9	12·1
	NP	..	..	..	8·3	..	8·3	97·5	93·6	95·0	91·7	100 0	91·7
7. Maharashtra .	P	100·0	100·0	100·0	100·0	100·0	100·0	..	..	..	..	..	..
	NP	97·3	..	2·9	85·2	..	5·3	2·7	100·0	97·1	14·2	100·0	94·7
8. M. P. . .	P	99·2	100·0	..	96·1	97·8	..	..	..	..	..	..	..
	NP	57·4	24·3	..	57·8	21·3	..	..	..	..	0·1	..	..
9. Madras . .	P	97·0	98·5	..	97·7	98·3	..	0·8	..	..	1·9	..	..
	NP	54·9	96·9	..	55·6	97·4	..	41·9	0·3	100·0	40·6	0·3	100·0
10. Mysore . .	P	97·5	97·8	100·0	98·5	97·8	..	2·5	2·2	..	1·6	2·2	..
	NP	93·7	15·4	6·2	94·7	15·1	1·9	2·0	82·1	93·7	2·5	84·9	98·1
11. Orissa . . .	P	95·9	100·0	..	91·5	76·2	..	4·1	..	..	0·2	..	..
	NP	56·2	82·7	..	50·6	80·7	..	39·2	14·5	..	37·3	0·9	..

12. Punjab . . .	P	100·0	100·0	..	100·0	100·0	..	..	..	..	..	..	..
	NP	100·0	..	..	92·8	..	..	..	..	..	..	..	..
13. Rajasthan . .	P	100·0	100·0	..	96·7	100·0	..	..	..	..	..	..	..
	NP	66·2	100·0	..	72·1	..	..	33·8	..	..	26·2	58·2	..
14. U. P. . . .	P	23·2	100·0	100·0	28·9	100·0	100·0	8·9	..	..	4·2	..	..
	NP	85·3	97·4	93·2	81·3	95·7	88·0	0·3	..	..	1·4	..	..
15. West Bengal . .	P	33·8	..	24·4	40·7	..	8·3	64·5	100·0	71·6	57·6	100·0	88·4
	NP	..	..	..	100·0	..	..	100·0	..	100·0	..	..	100·0
16. Himachal Pradesh	NP	..	..	..	..	..	..	19·3	81·4	..	40·3	31·1	..
All India . .	P	87·7	75·9	46·5	86·7	87·7	53·2	10·9	24·1	50·7	10·9	10·8	39·8
	NP	69·5	45·3	11·1	68·0	48·0	10·9	17·3	38·3	86·1	18·4	35·5	86·3
TOTAL . . .		80·8	64·9	35·0	80·0	73·6	37·6	13·3	29·2	62·2	13·6	19·5	56·9

TABLE NO. 5.3—*contd.*

Percentage share in sales of fertilisers by agencies type-wise during 1961-62 *and* 1962-63

State	District (P—Package NP—Non-package	% of fertilisers distributed, agency-wise and year-wise											
		Governmental agencies						Other sources					
		1961-62			1962-63			1961-62			1962-63		
		N	P	Grades	N	P	Grades	N	P	Grades	N	P	Grades
1	2	15	16	17	18	19	20	21	22	23	24	25	26
1. Andhra . .	P	..	..	..	..	..	..	0·1	..	..	2·2	..	..
	NP	21·0	9·1	84·8	22·8	12·7	96·2	0·1	0·2	..	0·8	0·1	..
2. Assam . . .	P	100·0	..	100·0	100·0	..	77·5	..	..	..	..	..	..
	NP	..	..	100·0	..	..	100·0	..	..	..	..	..	..
3. Bihar . . .	P	..	..	..	..	..	..	..	..	..	3·5	..	..
	NP	49·4	51·6	..	56·0	53·8	..	16·4	17·5	..	13·7	14·2	..
4. Gujarat . .	P	..	..	..	..	..	..	..	..	..	1·9	8·1	..
	NP	..	3·1	..	..	2·4	..	..	..	..	..	..	..
5. J & K . . .	P	..	..	..	2·6	100·0	..	..	..	..	0·1	..	..
6. Kerala . . .	P	..	..	..	0·5	0·3	..	3·1	..	3·8	2·0	3·1	13·4
	NP	2·4	6·3	4·9	..	..	..	..	..	..	..	..	..
7. Maharashtra .	P	..	..	..	..	..	..	..	..	..	..	..	..
	NP	..	..	..	..	..	..	..	..	..	0·6	..	..
8. M. P. . .	P	..	..	..	..	..	..	0·8	..	..	3·9	2·2	..
	NP	35·8	75·6	..	31·7	78·6	..	6·8	..	..	10·4	..	..
9. Madras . .	P	0·1	0·2	..	..	..	..	2·0	1·1	..	0·4	1·6	..
	NP	..	..	..	..	..	..	3·0	2·8	..	3·8	2·3	..
10. Mysore . .	P	..	..	..	..	..	..	..	..	..	..	..	..
	NP	2·4	..	..	..	..	..	1·9	2·5	..	2·8	...	..
11. Punjab . .	P	..	..	..	..	..	..	..	..	..	..	..	..
	NP	..	..	..	..	..	..	..	..	..	7·1	..	..
12. Rajasthan . .	P	..	..	..	3·3	..		..	..	..	..	..	..
	NP	..	..	..	..	41·8	..	..	..	..	1·7	..	..

13. Orissa . . .	P	..	..	..	8·3	23·8	..	..	..	..	..	..	..
	NP	2·7	1·3	..	8·5	18·4	..	1·9	1·3	..	3·6	..	..
14. U. P. . . .	P	51·7	..	..	64·2	..	..	16·2	..	..	2·7	..	..
	NP	3·5	2·6	6·2	6·4	4·2	11·9	10·9	..	0·6	10·9	..	..
15. W. Bengal . .	P	..	..	..	..	..	..	1·7	..	3·8	1·7	..	..
	NP	..	..	..	..	..	..	..	..	..	..	..	..
16. H.P.	NP	80·7	18·6	..	59·7	68·9	..	..	..	..	..	..	..
All India	P	0·8	..	0·1	1·3	0·2	..	0·6	..	2·7	1·1	1·3	7·0
	NP	10·5	15·3	2·8	9·8	16·2	2·8	2·8	1·1	..	3·8	0·3	..
TOTAL . . .		4·5	5·5	0·9	4·4	5·9	1·1	1·4	0·4	1·9	2·0	1·0	4·4

TABLE No. 5.4

Particulars of respondents obtaining credit facilities from source of supply during 1961-62 *and* 1962-63

Name of the State		Total No. of cultivators selected from Package and Non-package Districts	No. of cultivators receiving kind loans		No. of cultivators receiving cash loans		No. of cultivators receiving both cash & kind loans		Total No. of cultivators receiving facilities		Col. 9 as % to col. 2(61-62)	Col. 10 as % to col. 2 (62-63)
			1961-62	1962-63	1961-62	1962-63	1961-62	1962-63	1961-62	1962-63		
1		2	3	4	5	6	7	8	9	10	11	12
1. Andhra	P	104	4	5	28	28	..	..	24	33		
	NP	231	4	3	..	..	..	..	4	3		
	Total	335	8	8	20	28	..	..	28	36	8·3	10·7
2. Bihar	P	100	51	38	..	..	..	..	51	38		
	NP	140	..	1	..	..	..	..	..	1		
	Total	240	51	39	..	..	..	..	51	39	21·2	16·2
3. Gujarat	P	100	14	14	1	1	..	1	15	16		
	NP	100	1	2	36	38	..	..	37	40		
	Total	200	15	16	37	39	..	1	52	56	26·0	28·0
4. J & K	P	68	35	41	..	..	..	..	35	41		
	NP	Nil	..	..	..	..	..	..	..	..		
	Total	68	35	41	..	..	..	..	35	41	51·4	60·2
5. Kerala	P	101	14	17	10	6	9	25	33	48		
	NP	100	2	..	1	1	1	1	4	2		
	Total	201	16	17	11	7	10	26	37	50	18·4	24·8
6. M. P.	P	113	34	12	..	..	..	.	34	12		
	NP	351	25	34	3	4	..	..	28	38		
	Total	464	59	46	3	4	..	..	62	50	13·3	10·7
7. Maharashtra . . .	P	106	20	16	..	..	..	..	20	16		
	NP	218	3	4	1	2	..	..	4	6		
	Total	324	23	20	1	2	..	..	24	22	7.4	6·7
8. Madras . . .	P	118	40	34	..	..	42	54	82	88		
	NP	100	1	1	..	..	..	1	1	2		
	Total	218	41	35	..	..	42	55	83	90	38·0	41·2

9. Mysore	P	130	1	2	36	16	5	30	42	48		
	NP	276	13	12	..	1	..	..	13	13		
	Total	406	14	14	36	17	5	30	55	61	13·5	15·0
10. Rajasthan	P	108	4	13	..	..	..	..	4	13		
	NP	215	16	16	..	..	..	..	16	16		
	Total	323	20	29	..	..	..	..	20	29	6·3	8·9
11. U.P.	P	106	10	20	..	..	1	1	11	21		
	NP	325	64	66	4	1	6	11	74	78		
	Total	431	74	86	4	1	7	12	85	99	19·7	22·9
12. West Bengal	P	138	4	6	..	..	..	..	4	6		
	NP	140	..	..	..	..	..	..	..	..		
	Total	278	4	6	..	..	..	..	4	6	1·4	2·1
TOTAL	P	1,292							355	380		
	NP	2,196							181	199		
	Total .	3,488							536	579	15·3	16·6

TABLE No. 5·5

Distribution of selected blocks according to extension methods used for popularising fertilisers.

Name of the Extension method	Block agency				Private traders			
	Package		Non-Package		Package		Non-Package	
	No. of Blocks with Max. consumption	No. of Blocks with Min. consumption	No. of Blocks with Max. consumption	No. of Blocks with Min. consumption	No. of Blocks with Max. consumption	No. of Blocks with Min. consumption	No. of Blocks with Max. consumption	No. of Blocks with Min. consumption
1	2	3	4	5	6	7	8	9
1. Demonstration	15	13	23	23	7	5	2	4
2. Personal contacts	9	6	14	10	1	1	2	1
3. Group discussions, meetings & seminars	8	7	12	11	1	1	...	1
4. GST/VLT Camps . . .	8	9	13	12	...	...	...	...
5. Loan/Credit facilities.	5	4	9	12	2	1	1	1
6. **Special campaigns like kharif & Rabi campaigns**	3	4	4	3	...	..	...	...
7. Audio-visual publicity	6	4	7	7	1	2	...	..
8. Distribution of leaf-lets, posters, etc.	2	5	5	5	2	1	4	2
9. Kissan Melas	1	...	2	1	...	...	..	..
10. Exhibitions	2	3	2	2	...	...	...	...
11. Organising of tours & visit at the farms of the progressive farmers. .	2	2	1	1	...	...	...	...
12. Crop production plans/farm planning	2	2	...	...	...	...	...	...
13. Holding of crop competitions. .	..	1	..	1	..	..	..	..

Table No. 6·1

Details of cultivated holding of the sample respondents as on date of survey

(Area in Hectares)

State	Package districts							
	No. of respondents	owned holding	Leased in holding No.	Leased in holding Area	Leased out holding No.	Leased out holding Area	Total cultivated holding	Average
1	2	3	4	5	6	7	8	9
Andhra	100	214·85	31	38·23	5	5·20	247·88	2·47
Assam	100	157·63	56	38·50	3	52·13	144·00	1·43
Bihar	100	318·15	8	4·67	5	5·60	317·22	3·17
Gujarat	100	314·73	0	..	1	1·21	313·52	3·14
J & K	50	60·09	22	13·38	3	2·00	71·47	1·42
Kerala	100	174·36	43	111·13	9	4·01	281·48	2·81
M.P.	100	265·11	11	10·86	0	...	275·97	2·76
Madras	100	129·48	28	38·11	0	...	167·59	1·68
Maharashtra	100	204·46	2	1·64	0	...	206·10	2·09
Mysore	100	166·66	19	14·20	3	5·66	175·20	1·75
Orissa	100	123·33	6	3·39	3	1·90	124·82	1·24
Punjab	100	425·64	62	148·20	16	19·10	554·74	5·54
Rajasthan	100	471·40	4	7·34	1	5·02	473·72	5·74
Uttar Pradesh	100	224·50	12	12·32	0	...	236·82	2·37
West Bengal	100	183·68	48	62·03	5	17·52	228·19	2·28
Himachal Pradesh	..	..	..	...	NR	..	..	...
TOTAL	1450	3538·07	352	504·00	54	119·35	3922·71	2·91

TABLE No. 6·1 (*contd.*)

State	Non-package districts							
	No. of respondents	Owned holding	Leased in holding		Leased out holding		Total cultivated holding	Average
			No.	Area	No.	Area		
1	10	11	12	13	14	15	16	17
Andhra	200	461·83	44	29·04	8	5·17	485·70	2·43
Assam	100	161·52	51	48·26	14	19·11	190·67	1·89
Bihar	100	136·67	18	13·97	2	0·80	149·84	1·49
Gujarat	100	944·28	1	1·21	0	—	945·49	9·46
J & K	..	..	..	—	—	—	—	—
Kerala	100	139·19	65	67·08	14	21·22	185·05	1·85
M.P.	300	832·62	8	13·44	4	10·74	835·32	2·78
Madras	100	195·15	29	39·27	1	0·80	223·62	2·34
Maharashtra	200	870·45	57	76·86	0	—	947·13	4·73
Mysore	200	720·50	96	234·89	10	60·98	894·41	4·32
Orissa	100	147·73	40	13·81	5	9·70	151·84	1·51
Punjab	100	445·52	27	83·79	3	9·31	520·00	5·30
Rajasthan	199	957·68	19	41·97	4	15·36	984·29	4·94
Uttar Pradesh	300	681·95	13	8·77	2	0·99	689·73	2·30
West Bengal	100	155·85	33	23·22	8	13·37	165·70	1·65
Himachal Pradesh	100	183·56	31	29·72	9	13·84	199·44	1·99
TOTAL	2299	7044·50	532	725·12	84	181·39	7588·23	3·30

TABLE No. 6·2

Statement showing the land utilisation pattern of selected respondents during 1959-60 *to* 1962-63

(Area in Hectares)

State	District	Total gross cropped area				Net sown area				%net sown area irrigated			
		59-60	60-61	61-62	62-63	59-60	60-61	61-62	62-63	59-60	60-61	61-62	62-63
1	2	3	4	5	6	7	8	9	10	11	12	13	14
Andhra	Package	514·0	544·1	550·6	497·0	264·6	272·4	280·0	256·2	99·7	100·0	100·0	100·0
	Non-package	601·7	600·1	633·9	619·1	448·7	445·9	463·5	443·3	56·7	58·2	57·7	57·9
Assam	P	182·6	183·5	189·1	190·0	139·3	140·1	143·7	143·7	Nil	Nil	Nil	Nil
	NP	184·9	210·6	227·3	247·9	145·3	164·8	175·4	186·6	Nil	Nil	Nil	Nil
Bihar	P	509·0	506·1	519·5	517·0	312·8	312·8	316·1	317·1	65·7	65·6	67·0	66·2
	NP	204·8	217·7	217·5	218·7	138·4	141·4	141·3	145·7	4·5	14·6	13·7	14·1
Gujarat	P	344·1	349·2	348·2	349·7	291·6	293·0	291·3	295·3	8·9	10·6	14·0	15·4
	NP	949·6	945·7	950·5	1002·4	935·2	935·7	934·5	948·1	26·1	24·9	17·7	18·4
J & K	P	78·9	85·4	78·6	82·6	68·7	68·8	68·8	68·9	88·7	88·7	88·7	88·8
	NP	..	..	...	...	...	..	..	..	..	..	..	...
Kerala	P	270·5	264·3	288·0	279·3	260·2	259·4	281·0	274·0	79·9	80·4	81·4	80·3
	NP	232·7	222·3	220·8	229·3	174·0	172·8	173·3	173·5	35·2	36·0	35·6	36·8
M.P.	P	305·1	301·8	305·2	298·1	263·0	260·8	263·1	261·7	53·2	53·5	52·9	55·2
	NP	1076·5	1055·4	1065·8	1113·0	834·7	825·0	824·3	866·5	38·8	39·2	38·9	37·4
Madras	P	373·8	373·4	373·4	373·1	167·7	168·1	168·2	167·7	96·5	96·2	96·2	96·5
	NP	373·6	389·1	381·3	379·3	202·8	203·5	216·2	215·5	92·1	91·9	91·9	92·5
Maharastra	P	313·6	313·6	313·0	311·1	208·2	208·2	208·2	208·0	65·9	65·9	65·9	65·8
	NP	920·4	924·9	930·1	929·5	900·5	909·1	904·1	905·9	0·7	0·7	0·7	0·8
Mysore	P	276·8	276·4	279·2	278·9	175·2	175·2	176·2	176·0	71·1	71·1	71·3	71·3
	NP	918·5	936·3	957·0	970·8	845·5	939·4	892·3	895·6	15·7	17·4	35·9	40·8
Orissa	P	124·0	127·7	127·2	132·5	123·0	123·9	122·6	124·3	28·7	27·3	26·8	27·9
	NP	234·2	235·5	237·4	229·3	154·8	160·2	154·3	156·5	75·7	76·9	75·7	69·8
Punjab	P	631·8	638·9	653·9	675·5	495·5	504·6	525·0	533·9	76·6	76·1	76·3	75·9
	NP	549·0	671·1	675·1	684·9	432·3	508·4	513·7	499·6	49·4	49·5	82·7	57·5

TABLE 6·2—*contd.*

1	2	3	4	5	6	7	8	9	10	11	12	13	14
jasthan	P	445·9	452·3	461·3	449·5	425·0	428·8	441·5	422·9	53·9	54·6	54·2	54·2
	NP	961·8	970·6	975·8	1018·9	887·4	898·8	897·5	919·2	57·4	60·2	61·3	63·8
P.	P	369·6	407·6	386·0	375·0	241·6	260·8	246·4	250·2	85·4	86·7	84·3	81·0
	NP	984·4	907·3	992·2	1004·7	666·3	668·2	677·2	681·1	71·5	71·6	71·0	69·9
. Bengal	P	253·6	255·7	257·4	257·8	232·3	234·8	234·7	239·0	74·0	74·0	73·7	73·5
	NP	254·7	256·5	265·3	262·9	159·8	163·2	166·5	162·6	0·1	0·1	0·6	0·8
P.	P	..	..	..	..	..	..	..	..	..	..	..	..
	NP	326·1	331·8	332·1	325·3	119·6	203·4	202·8	199·4	10·8	11·0	10·7	10·1
l States	P	4993·3	5079·9	5130·5	5067·1	3668·7	3711·7	3767·7	3759·0	64·1	64·5	64·8	64·5
	NP	8772·7	8937·8	9062·4	9236·4	7125·3	7335·4	7342·0	7398·9	35·8	36·4	38·2	39·1

TABLE No. 6·2—*contd.*

(Area in hectares)

State	District	Current fallows as % to net sown area				Orchards as % to net sown area			
		1959-60	1960-61	1961-62	1962-63	1959-60	1960-61	1961-62	1962-63
1	2	15	16	17	18	19	20	21	22
Andhra	Package	0·1	0·3	1·1	0·1	4·0	3·9	3·8	4·3
	Non-package	5·5	7·0	4·6	6·7	1·0	1·0	1·0	1·0
Assam	P	0·0	0·0	0·0	0·0	0·0	0·0	0·0	0·0
	NP	0·3	0·7	0·6	0·3	1·0	1·8	1·7	1·6
Bihar	P	0·0	0·0	0·0	0·0	0·0	0·0	0·0	0·0
	NP	0·1	0·1	0·1	0·3	3·6	3·6	3·6	3·6
Gujarat	P	0·7	1·2	2·0	0·3	6·3	6·3	6·3	6·3
	NP	0·3	0·1	0·2	0·3	0·0	0·0	0·0	0·0
J & K	P	0·1	0·0	0·0	0·0	1·5	1·6	1·4	1·6
	NP	..	..	..	..	..	..	..	..
Kerala	P	0·1	0·1	0·2	0·4	..	..	Nil	..
	NP	0·0	0·0	0·0	0·0	..	Nil	..	..
M.P.	P	1·8	2·5	1·2	4·0	..	..	..	..
	NP	2·9	4·9	4·3	5·0	..	..	..	..
Madras	P	0·3	0·1	0·2	0·4	0·4	0·4	0·4	0·4
	NP	0·0	0·0	0·0	0·0	0·0	0·0	0·0	0·0
Maharashtra	P	1·4	2·2	2·5	0·9	..	..	..	..
	NP	3·2	3·3	2·8	3·3	..	..	..	..
Mysore	P	0·0	0·0	0·0	0·0	0·2	0·2	0·2	0·2
	NP	0·3	0·5	0·6	0·9	0·03	0·02	0·03	0·03
Orissa	P	..	..	..	1·1	0·0	0·0	0·0	0·0
	NP	..	..	..	0·0	0·04	0·04	0·04	0·04
Punjab	P	1·1	0·9	1·0	3·2	..	..	..	..
	NP	3·0	3·8	4·7	6·0	..	..	..	..

TABLE 6·2—*contd.*

1	2	15	16	17	18	19	20	21	22
Rajasthan	Package	NA	NA	NA	NA	0·0	0·0	0·0	0·0
	Non-package	NA	NA	NA	NA	0·1	0·1	0·1	0·1
U.P.	P	0·0	0·0	0·0	0·0	1·5	1·4	1·5	1·5
	NP	1·9	1·6	1·0	1·1	1·4	1·4	1·4	1·4
West Bengal	P	0·0	0·0	0·0	0·0	0·0	0·0	0·0	0·0
	NP	2·1	1·6	0·6	1·7	0·5	0·5	0·5	0·5
H.P.	P	NR	..	..	..	NR	..	...	..
	NP	NIL	..	0·1	0·8	2·4	2·3	2·3	2·4
All States.	P	0·4	0·6	0·5	0·9	0·9	0·9	0·9	0·9
	NP	1·6	1·9	1·7	2·1	0·4	0·4	0·4	0·4

TABLE No. 6.3

Percentage of selected respondents growing the four specified crops and area covered under them during 1962-63

State	District	Gross cropped area	% growing the crop to total respondents				% of total area under the crop to gross cropped area			
			Paddy	Wheat	S. Cane	G. Nut	Paddy	Wheat	S. Cane	G. Nut
1	2	3	4	5	6	7	8	9	10	11
Andhra	Package	497·0	100·0	1·0	11·0	8·0	57·1	0·1	1·8	1·1
	Non-package	619·1	97·5	0·5	6·0	47·0	44·7	0·0	0·8	15·7
Assam	P	189·9	100·0	0·0	0·0	Nil	99·4	0·0	0·0	Nil
	NP	247·9	97·0	1·0	1·0	Nil	64·3	0·1	0·02	Nil
Bihar	P	517·0	100·0	99·0	30·0	Nil	41·8	20·5	2·4	Nil
	NP	218·7	85·0	56·0	0·0	Nil	41·9	11·3	0·0	Nil
Gujarat	P	349·8	82·0	7·0	10·0	32·0	19·0	0·8	5·6	10·2
	NP	1002·3	4·0	61·0	16·0	86·0	0·1	6·4	0·2	47·7
J & K	P	82·6	100·0	..	...	..	69·8	..	..	..
	NP	..	..	..	..	NR	..	..	..	..
Kerala	P	279·3	71·0	Nil	10·0	Nil	79·2	Nil	1·0	Nil
	NP	229·3	78·0	Nil	1·0	Nil	60·5	Nil	0·0	Nil
M.P.	P	298·1	99·0	17·0	0·0	0·0	73·8	2·4	0·0	0·0
	NP	1113·0	53·3	58·7	2·7	17·3	19·8	14·9	0·3	7·2
Madras	P	373·1	100·0	Nil	Nil	14·0	56·8	Nil	Nil	1·1
	NP	379·7	99·0	Nil	Nil	11·0	84·0	Nil	Nil	3·1
Maharashtra	P	311·1	100·0	24·0	0·0	0·0	50·9	8·8	0·0	0·0
	NP	929·5	55·8	5·0	0·5	20·1	15·0	1·7	0·04	9·5
Mysore	P	278·9	98·0	1·0	35·0	21·0	43·4	0·4	6·2	3·5
	NP	970·8	63·5	1·0	8·0	5·5	22·1	0·1	1·3	2·3
Orissa	P	132·5	100·0	1·0	13·0	14·0	94·5	0·03	0·7	2·0
	NP	229·3	100·0	0·0	0·0	0·0	65·9	0·0	0·0	0·0
Punjab	P	675·5	Nil	86·0	75·0	33·0	Nil	32·1	4·2	13·2
	NP	684·9	22·0	86·0	52·0	0·0	1·2	16·3	2·5	0·0

TABLE 6·3—*contd.*

1	2	3	4	5	6	7	8	9	10	11
Rajasthan . . .	Package .	449·5	Nil	49·0	Nil	0·0	Nil	21·8	Nil	0·0
	Non-Package	1018·9	10·6	72·4	20·6	4·5	1·4	23·8	1·3	0·8
W. Bengal . . .	P . . .	257·8	100·0	27·2.	45·0	Nil	88·5	1·0	2·1	Nil
	NP . .	262·9	100·0	0·0	3·0	Nil	77·7	0·0	0·3	Nil
H.P.	P . . .	..	..	..	NR	..	..	..	..	..
	NP . .	325·3	80·0	95·0	45·0	3·0	8·8	31·7	3·7	0·1
U.P. . . .	P . . .	375·0	16·2	80·8	36·4	0·0	2·6	19·9	4·5	0·0
	NP . .	1004·7	65·7	74·7	63·0	0·3	10·3	16·3	14·6	0·0
All States . . .	P . . .	5067·1	77·1	27·1	18·3	8·4	41·6	10·6	2·2	2·9
	NP . .	9236·4	64·2	37·3	16·8	13·4	22·4	9·7	2·3	8·5

TABLE No. 6·3—*contd.*

State	District	Gross cropped area	% area irrigated under the crop to total crop area			
			Paddy	Wheat	Sugarcane	Ground-nut
1	2	3	12	13	14	15
Andhra	Package	497·0	100·0	100·0	100·0	100·2
	Non-package	619·1	99·9	0·0	100·0	47·2
Assam	P	189·9	0·0	Nil	Nil	Nil
	NP	247·9	0·0	Nil	Nil	Nil
Bihar	P	517·0	77·4	71·5	100·0	Nil
	NP	218·7	14·8	1·6	0·0	Nil
Gujarat	P	349·8	10·8	40·9	91·5	Nil
	NP	1002·3	100·0	98·7	100·0	Nil
J & K	P	82·6	100·0	. .	. .	. .
	NP	. .	. .	NR	. .	. .
Kerala	P	279·3	99·1	Nil	98·5	Nil
	NP	229·3	44·9	Nil	100·0	Nil
M.P.	P	298·1	65·1	0·0	0·0	Nil
	NP	1113·0	55·0	63·1	100·0	Nil
Madras	P	373·1	100·0	Nil	Nil	99·1
	NP	379·7	98·9	Nil	Nil	10·0
Maharashtra	P	311·1	86·3	2·6	0·0	Nil
	NP	929·5	0·9	9·1	100·0	Nil
Mysore	P	278·9	100·0	Nil	97·6	91·6
	NP	970·8	50·3	Nil	100·0	15·6
Orissa	P	132·5	30·3	100·0	90·5	29·6
	NP	229·3	69·6	0·0	0·0	0·0
Punjab	P	675·5	Nil	79·0	100·0	Nil
	NP	684·9	74·5	90·9	95·2	Nil

TABLE 6·3—*contd.*

1	2	3	12	13	14	15
Rajasthan	Package	449·5	Nil	100·0	Nil	Nil
	Non-Package	1018·9	100·0	71·9	100·0	Nil
West Bengal	P	257·8	72·6	100·0	100·0	Nil
	NP	262·9	0·0	0·0	0·0	Nil
H. Pradesh	P	..	..	NR	..	..
	NP	325·3	46·4	4·2	1·3	Nil
U.P.	P	375·0	38·6	99·5	88·1	Nil
	NP	1004·7	18·9	91·0	92·1	Nil
All States	P	5067·1	73·8	86·3	96·3	13·0
	NP	9236·4	51·1	67·1	88·2	6·3

TABLE No. 6·4

Percentage of respondents reporting knowledge and use of fertilisers over specified periods of time in package and non-package districts

State	District	Total no. of respondents with knowledge	1950-51 & before		By the end of 1955-56		By the end of 1960-61		By the end of 1961-62		By the end of 1962-63	
			% knowing (% to col 3)	% using (% to col. 4)	% knowing (% to col. 3)	% using (% to col. 6	% knowing (% to col. 3)	% using (% to col. 8)	% knowing (% to col. 3)	% using (% to col. 10)	% knowing (% to col 3)	% using (% to col. 12)
1	2	3	4	5	6	7	8	9	10	11	12	13
Andhra	Package	100	68·0	55·8	85·0	72·9	100·0	95·0	100·0	99·0	100·0	99·0
	Non-package	200	10·5	61·9	33·5	52·2	92·5	57·8	97·5	68·7	99·5	76·8
Assam	P	15	6·6	..	13·3	..	73·3	63·6	86·6	84·6	100·0	93·3
	NP	29	..	..	..	..	79·3	21·7	86·2	20·0	100·0	20·6
Bihar	P	100	31·0	100·0	50·0	96·0	99·0	67·6	100·0	84·0	100·0	92·0
	NP	92	3·2	..	42·3	38·4	100·0	44·5	100·0	51·0	100·0	55·4
Gujarat	P	92	13·0	66·6	20·6	63·1	95·6	53·4	100·0	55·4	100·0	60·8
	NP	92	..	..	3·2	..	98·9	72·5	100·0	79·3	100·0	83·6
J & K	P	50	..	..	36·0	..	100·0	78·0	100·0	88·0	100·0	98·0
	NP	..	..	..	..	..	NR	..	..	..	..	..
Kerala . . .	P	100	37·0	59·4	65·0	64·6	100·0	77·0	100·0	81·0	100·0	87·0
	NP	97	6·1	33·3	22·6	27·2	97·9	40·0	100·0	45·3	100·0	51·5
M.P.	P	100	2·0	100·0	25·6	24·0	90·0	37·7	100·0	56·0	100·0	59·0
	NP	200	1·5	50·0	11·9	32·2	77·3	45·7	90·7	50·0	100·0	51·5
Madras	P	100	2·0	100·0	4·0	50·0	74·0	87·8	100·0	90·0	100·0	94·0
	NP	99	43·8	58·1	56·5	62·5	92·9	66·3	100·0	69·9	100·0	71·7
Maharashtra . .	P	90	..	..	5·5	20·0	95·5	39·5	100·0	48·8	100·0	51·1
	NP	138	8·6	33·3	26·0	33·3	94·2	34·6	97·1	35·8	97·8	37·7
Mysore . . .	P	100	47·0	87·2	51·0	84·3	89·0	78·6	97·0	83·5	100·0	97·0
	NP	162	1·8	33·3	40·1	21·5	95·6	36·1	98·1	40·8	100·0	45.6

TABLE 6.4—(*contd.*)

1	2	3	4	5	6	7	8	9	10	11	12	13
Orissa	Package	73	2·7	100·0	13·6	50·0	75·3	38·1	82·1	45·0	100·0	49·3
	Non-package	99	17·1	58·8	38·3	57·8	98·9	60·2	98·9	64·2	98·9	70·4
Punjab	P	99	15·6	66·6	67·6	68·6	94·0	81·9	98·9	87·7	100·0	96·9
	NP	98	1·0	..	14·2	42·8	95·9	36·1	98·9	39·1	100·0	51·0
Rajasthan	P	84	..	..	17·8	13·3	80·9	7·3	92·8	11·5	100·0	25·0
	NP	178	..	..	16·8	26·6	79·7	33·0	94·9	40·8	96·0	50·8
U.P.	P	97	2·0	50·0	11·3	45·4	89·6	40·2	97·9	57·8	98·9	67·7
	NP	282	8·8	80·0	24·8	71·4	90·0	63·3	96·8	64·8	100·0	67·0
E. Bengal	P	97	24·7	25·0	70·1	39·7	98·9	69·7	100·0	77·3	100·0	82·4
	NP	56	3·5	50·0	53·5	33·3	94·6	37·7	98·2	40·0	100·0	42·8
H. Pradesh	P	..	..	..	..	..	..	NR	..	..	..	..
	NP	97	..	..	31·9	12·9	91·7	51·6	93·8	56·0	96·9	61·7
All States	P	1297	18·7	67·0	38·1	60·8	91·5	62·3	97·9	70·3	99·9	76·4
	NP	1979	6·9	56·9	26·8	42·6	90·6	48·9	96·6	53·5	99·2	58·2

TABLE No. 6·5

Percentage of respondent of various categories reporting knowledge and use of fertilisers

Category of Respondents	Total no. of respondents with knowledge	1950-51 & before		By the end of 1955-56		By the end of 1960-61		By the end of 1961-62		By the end of 1962-63	
		% knowing (% to col. 2)	% using (% to col. 3)	% knowing (% to col. 2)	% using (% to col. 5)	% knowing (% to col. 2)	% using (% to col. 7)	% knowing (% to col. 2)	%using (%to col. 9)	% knowling (% to col. 2)	%using (% to col. 1)
1	2	3	4	5	5	7	8	9	10	11	12
Package											
Owners	1079	19·6	69·3	38·0	64·4	93·0	63·6	98·5	71·9	99·9	78·5
Tenants	270	15·9	46·5	37·7	49·0	86·2	63·5	97·7	71·9	100·0	82·5
Others	114	13·1	60·0	33·3	36·8	83·3	38·9	91·2	42·3	100·0	45·6
TOTAL	1297	18·7	67·0	38·1	60·8	91·5	62·3	97·9	70·3	99·9	76·4
Non-package											
Owners	1639	6·8	59·8	26·0	45·9	90·4	51·6	96·4	56·3	99·3	60·6
Tenants	488	6·1	46·6	35·4	22·5	93·4	33·9	98·3	41·4	99·5	47·1
Others	180	5·5	20·0	18·3	24·2	87·2	30·5	95·5	29·6	97·7	38·0
TOTAL	1979	6·9	56·9	26·8	42·6	90·6	48·9	96·6	53·5	99·2	58·2

TABLE No. 6·6

Percentage of respondents reporting knowledge and use of fertilisers by types

State	Type of district	No. of respon-dents	Before 50-51		1955-56		1960-61		1961-62		1962-63	
			% knowing	% using	% knowing	% using	% knowing	% using	% knowing	% using	% knowing	% using
1	2	3	4	5	6	7	8	9	10	11	12	13
Andhra	Package	100	61·0	49·1	79·0	65·8	99·0	92·9	100·0	98·0	100·0	98·0
	Non-Package	200	8·5	76·4	29·0	53·4	92·0	57·6	97·5	67·1	99·5	75·8
Assam	P	15	Nil	Nil	6·6	Nil	26·6	5·0	33·3	60·0	40·0	66·6
	NP	29	Nil	..	Nil	..	75·8	13·6	82·7	12·5	96·5	14·2
Bihar	P	100	31·0	100·0	50·0	96·0	99·0	57·6	100·0	84·0	100·0	92·0
	NP	92	3·2	Nil	41·3	39·4	100·0	44·5	100·0	51·0	100·0	55·4
Gujarat	P	92	13·0	58·3	20·6	57·8	93·4	48·8	87·8	30·0	97·8	52·2
	NP	92	Nil	..	1·0	Nil	82·6	22·3	85·8	22·7	85·8	22·7
J & K	P	50	Nil	..	36·0	Nil	100·0	78·0	100·0	88·0	100·0	98·0
	NP	NR	..	..	..	..	..	..	..	..	..	..
Kerala	P	100	31·0	51·6	59·0	55·9	100·0	67·0	100·0	69·0	100·0	73·0
	NP	97	5·1	40·0	20·6	25·0	92·7	31·1	96·9	35·1	97·9	35·7
M.P.	P	100	2·0	100·0	25·0	20·0	90·0	36·6	100·0	54·0	100·0	57·0
	NP	260	1·5	50·0	11·5	33·3	74·6	42·7	87·3	46·6	96·5	46·2
Madras	P	100	2·0	100·0	4·0	50·0	73·0	87·6	100·0	90·0	100·0	93·0
	NP	99	42·4	52·3	52·5	46·1	90·9	55·5	98·9	45·9	98·9	51·0
Maharashtra . . .	P	90	Nil	..	4·4	25·0	95·5	34·8	100·0	45·5	100·0	48·8
	NP	138	8·6	33·3	26·0	33·3	94·2	33·0	97·1	33·5	97·1	35·0
Mysore	P	100	47·0	87·2	51·0	84·3	89·0	76·4	97·0	80·4	100·0	95·0
	NP	162	1·8	33·3	40·1	21·5	95·6	33·5	98·1	37·1	100·0	40·7
Orissa	P	73	2·7	100·0	13·6	50·0	75·3	38·1	82·1	45·0	100·0	49·3
	NP	99	17·1	58·8	38·3	57·8	98·9	60·2	98·9	64·2	98·9	70·4
Punjab	P	99	51·1	66·6	67·6	68·6	93·9	82·7	98·9	87·7	100·0	96·9
	NP	98	1·0	Nil	14·2	42·8	95·9	36·1	98·9	39·1	100·0	51·0

Rajasthan . . .	P	84	Nil	..	17·8	13·8	79·7	7·4	91·6	10·3	98·8	25·3
	NP	178	Nil	..	16·8	26·6	79·7	33·0	94·3	40·4	95·5	50·5
U.P. . . .	P	97	2·0	50·0	11·3	45·4	89·6	40·2	97·9	57·8	98·9	67·7
	NP	282	8·8	80·0	24·8	71·4	86·8	59·5	94·3	59·7	98·9	63·0
W. Bengal . . .	P	97	24·7	25·0	69·0	38·8	98·9	63·5	100·0	69·0	100·0	69·0
	NP	56	3·5	50·0	51·7	34·4	80·3	24·4	83·9	27·6	85·7	27·0
H. Pradesh . . .	P	NR	..	..	..	..	..	..	..	..	..	..
	NP	97	Nil	..	31·9	12·9	91·7	51·6	93·8	56·0	96·9	61·7
All States	P	1297	17·6	64·6	37·0	58·0	90·5	59·8	97·0	67·4	98·9	72·9
	NP	1979	6·6	57·2	25·8	41·2	88·2	43·3	94·4	47·0	97·2	51·3

NOTE : %knowing to total respondents.
% Using to those knowing.

TABLE 6.6—(*contd.*)

		3	14	15	16	17	18	19	20	21	22	23
Andhra	P	100	13·0	7·6	39·0	15·3	88·0	26·1	95·0	52·1	97·0	47·7
	NP	200	Nil	..	0·5	Nil	53·5	28·0	73·0	29·4	79·5	42·1
Assam	P	15	..	..	..	...	Nil	..	..	...	...	
	NP	29	Nil	..	Nil	..	27·5	25·0	31·0	22·2	34·4	20·0
Bihar	P	100	Nil	..	1·0	100·0	37·0	35·1	92·2	40·2	92·2	51·0
	NP	92	3·2	Nil	38·0	42·8	95·6	45·4	95·6	52·2	95·6	56·8
Gujarat	P	92	9·7	66·6	14·1	53·8	79·3	36·9	82·6	39·4	82·6	43·4
	NP	92	Nil	..	3·2	Nil	98·9	64·8	100·0	71·7	100·0	79·3
J & K	P	50		..	..	—	..	Nil	...	—	—	..
	NP	NR	NR	..	..	..	..	..	..	..	..	..
Kerala	P	100	17·0	35·2	26·0	38·8	93·0	43·0	96·0	51·0	97·0	58·7
	NP	97	4·1	25·0	9·2	36·3	62·8	24·5	69·0	26·8	73·1	28·1
M.P.	P	100	2·0	50·0	14·0	14·2	72·0	2·7	98·0	29·5	98·0	36·7
	NP	260	0·7	50·0	5·7	26·6	62·3	20·9	74·2	24·8	83·4	29·0
Madras	P	100	Nil	..	Nil	..	42·0	61·9	81·0	55·5	81·0	60·4
	NP	99	28·2	10·7	31·3	12·9	50·5	22·0	50·5	22·0	50·0	22·0
Maharashtra . . .	P	90	Nil	..	5·5	20·0	95·5	17·4	100·0	22·2	100·0	23·3
	NP	138	1·4	50·0	6·5	44·4	71·7	27·2	73·1	30·6	74·6	31·0
Mysore	P	100	46·0	86·9	50·0	84·0	85·0	77·6	93·0	81·7	99·0	91·9
	NP	162	Nil	..	10·4	47·0	45·0	42·4	48·1	46·1	50·0	51·8
Orissa . . .	P	73	Nil	..	Nil	..	35·6	30·7	41·0	33·3	56·1	34·1
	NF	99	Nil	..	5·0	Nil	59·5	16·9	67·6	17·9	74·7	27·0
Punjab	P	99	Nil	..	Nil	..	51·5	7·8	69·6	23·1	77·7	35·0
	NP	98	Nil	..	Nil	..	Nil	..	Nil	..	1·0	Nil
Rajasthan . . .	P	84	Nil	..	5·9	Nil	51·1	Nil	61·9	5·7	69·0	5·1
	NP	178	Nil	..	Nil	..	10·6	15·7	19·6	17·1	26·2	12·7
U.P.	P	97	Nil	Nil	2·0	Nil	22·6	4·5	28·8	7·1	28·8	17·8
	NP	282	Nil	..	0·7	Nil	17·7	46·0	22·3	50·7	24·4	53.6
W. Bengal	P	97	5.1	Nil	12.3	16·6	38.1	18.9	38 1	18.9	38·1	18·9
	NP	56	Nil	..	1.7	Nil	7.1	Nil	10 7	Nil	10·7	Nil
H. Pradesh	P	NR	NR	..	..	..	..	..	..	..	..	..
	NP	97	Nil	..	27·8	3·7	74·2	40·2	76·2	47·2	18·4	52·5
All States	P	1297	7·0	60·8	13·7	42·1	58·2	30·7	72·2	38·8	74·8	44·9
	NP	1079	1·9	15·3	7·8	25·1	47·6	33·2	54·0	36·1	57·9	40·4

TABLE 6.6—(*contd.*)

			All Grades									
1	2	3	24	25	26	27	28	29	30	31	32	33
Andhra	P	100	28·0	64·2	53·0	66·0	85·0	68·2	86·0	70·9	86·0	72·0
	NP	200	2·5	Nil	5·0	40·0	13·0	30·7	13·5	37·0	14·5	41·3
Assam	P	15	6·6	Nil	6·6	Nil	60·0	55·5	66·6	80·0	73·3	90·9
	NP	29	Nil	..	Nil	..	17·2	20·0	20·6	16·6	20·6	16·6
Bihar	P	100	Nil	..	Nil	..	1·0	100·0	61·0	16·3	62·0	33·8
	NP	92	Nil	..	Nil	..	Nil	..	1·0	Nil	6·5	Nil
Gujarat	P	92	1·0	100·0	1·0	100·0	2·1	100·0	2·1	100·0	2·1	100·0
	NP	92	Nil	..	Nil	..	2·1	50·0	2·1	100·0	2·1	100·0
J & K	P	50	Nil	..	Nil	..	Nil	..	Nil	..	Nil	..
	NP	NR	..	..		..	..	NR	..	..	..	NR
Kerala	P	100	14·0	57·1	27·0	62·9	95·0	60·0	99·0	69·6	99·0	79·7
	NP	97	Nil	..	4.1	25·0	74·2	30·5	80·4	37·1	84·5	43·9
M.P.	P	100	Nil	..	Nil	..	Nil	..	Nil	..	Nil	..
	NP	260	Nil	..	Nil	..	Nil	..	Nil		Nil	..
Madras	P	100	Nil	..	Nil	..	3·0	Nil	6·0	16·6	17·0	5·8
	NP	99	23·2	73·9	47·4	63·8	92·9	60·8	100·0	66·6	100·0	67·6
Maharashtra . . .	P	90	Nil	..	Nil	..	Nil	..	Nil	..	Nil	..
	NP	138	Nil	..	Nil	..	0·7	100·0	0·7	100·0	0·7	100·0
Mysore	P	100	2·0	Nil	2·0	Nil	11·0	54·5	15·0	80·0	15·0	86·6
	NP	162	Nil	..	3·0	40·0	30·8	34·0	32·7	35·8	33·3	44·4
Orissa	P	73	Nil	..	Nil	..	Nil	..	Nil	..	Nil	..
	NP	99	Nil	..	Nil	..	Nil	..	Nil	..	Nil	..
Punjab	P	99	Nil	..	Nil	..	Nil	..	Nil	..	Nil	..
	NP	98	Nil	..	Nil	..	Nil	..	Nil	..	Nil	..
Rajasthan . . .	P	84	Nil	..	Nil	..	Nil	..	Nil	..	Nil	..
	NP	178	Nil	..	Nil	..	Nil	..	Nil	..	Nil	..
U. Pradesh	P	97	Nil	..	Nil	..	2·0	50·0	3·0	100·0	3·0	100·0
	NP	282	Nil	..	Nil	..	13·8	64·1	25·1	63·3	29·4	73·4
W. Bengal	P	97	Nil	..	12·3	25·0	75·2	35·6	80·4	47·4	82·4	53·7
	NP	56	Nil	..	10·7	16·6	58·9	45·4	58·9	45·4	58·9	54·5
H. Pradesh	P	NR	..	..	..	..	..	..	NR	..	..	..
	NP	97	Nil	..	Nil	..	Nil	Nil	Nil	..	Nil	..
All States	P	1297	3·5	65·2	7·4	61·4	21·6	55·5	27·7	56·3	28·9	62·4
	NP	1979	1·4	60·7	3·6	52·7	16·1	45·6	18·7	50·6	19·9	56·2

TABLE No. 6·7

Percentage of respondents of various categories reporting knowledge and use of fertilisers by types

Group of fertilizers	Category of respondents	Package										
		No. of respon-dents*	Before 1951-51		1955-56		1960-61		1961-62		1962-63	
			% knowing	% using	% knowing	% using	% knowing	% using	% knowing	% using	% knowing	% using
1	2	3	4	5	6	7	8	9	10	11	12	13
N	Owners	1079	18·8	66·9	37·0	62·5	92·1	61·5	97·7	69·5	99·0	75·6
	Tenants	270	14·4	41·0	37·0	44·0	83·3	60·4	94·4	67·0	95·9	76·8
	Others	114	12·2	50·0	31·5	30·5	83·3	36·8	91·2	38·4	100·0	41·2
	Total	1297	17·6	64·6	37·0	58·1	90·5	59·8	97·0	67·4	98·9	72·9
P	Owners	1079	7·3	64·5	13·9	44·4	61·2	31·4	76·1	40·1	78·2	46·6
	Tenants	270	5·9	50·0	10·0	37·0	40·0	22·2	51·4	25·1	55·5	36·6
	Others	114	8·7	40·0	14·9	35·2	54·3	27·4	59·6	33·8	65·7	34·6
	Total	1297	7·0	60·8	13·7	42·1	58·2	30·7	72·2	38·8	74·8	44·9
G	Owners	1079	3·3	66·6	7·1	64·9	19·2	60·1	26·0	57·6	27·1	64·1
	Tenants	270	1·8	40·0	5·1	28·5	26·2	39·4	29·6	51·2	33·3	57·7
	Others	114	4·3	80·0	7·0	62·5	31·5	36·1	32·4	48·6	32·4	54·0
	Total	1297	3·5	65·2	7·4	61·4	21·6	55·5	27·7	56·3	28·9	62·4

NOTE : % knowing to total respondents.
% using to those knowing.
*Total No. with knowledge.

TABLE 6.7—*Contd.*

Group of fertilizers	Category of of respondents	Non-Package										
		No. of respon-dents*	Before 1950-51		1955-56		1960-61		1961-62		1962-63	
			% know-ing	% using	% know-ing	% using	% know-ing	% using	% know-ing	% using	% know-ing	% using
1	2	14	15	16	17	18	19	20	21	22	23	24
N	Owners .	1,639	6·5	59·8	25·0	44·8	87·9	46·0	94·0	50·0	97·1	53·9
	Tenants	488	6·1	46·6	34·6	21·3	92·0	30·0	97·1	35·8	98·5	41·9
	Others .	180	5·0	22·2	17·2	22·5	83·8	29·8	93·8	27·8	96·6	35·0
	Total .	1,979	6·6	57·2	25·8	41·2	88·2	43·3	94·4	47·0	97·2	51·3
P	Owners .	1,639	1·7	17·2	7·4	27·8	48·3	34·3	54·8	37·2	59·1	41·5
	Tenants .	488	1·2	16·6	9·4	10·8	42·6	24·5	46·9	29·2	48·9	34·7
	Others .	180	2·7	Nil	8·8	12·5	43·8	22·7	50·0	22·2	52·7	25·2
	Total .	1,979	1·9	15·3	7·8	25·1	47·6	33·2	54·0	6·1	57·9	40·4
G	Owners .	1,369	1·5	61·5	3·5	54·2	15·0	51·2	17·2	55·1	18·4	60·5
	Tenants .	488	0·2	Nil	2·2	36·3	14·5	33·8	16·8	45·1	17·4	49·4
	Others .	180	0·5	100·0	2·7	40·0	18·3	12·1	22·7	17·0	23·8	23·2
	Total .	1,979	1·4	60·7	3·6	52·7	16·1	45·6	18·7	50·6	19·9	56·2

Note: % knowing to total respondents. % using to those knowing.
*Total No. with knowledge.

TABLE 6.8

Percentage of respondents reporting use of fertilisers only, both fertilisers and manures and manures only during 1959-60 to 1962-63

Details	Proportion of relevant respondents using				fertilisers only, fertilisers & manures etc.			
	Package				Non-Package			
	1959-60	1960-61	1961-62	1962-63	1959-60	1960-61	1961-62	1962-63
1	2	3	4	5	6	7	8	9
			Paddy (Irrigated)					
1. No. for whom crop relevant	888	979	907	910	841	865	858	850
2. % using fertilisers only	7·6	9·1	11·0	13·5	6·4	7·6	7·7	9·4
3. % using fertilisers & manures	36·2	48·7	61·3	64·6	28·9	32·6	34·9	39·8
4. % using manures only	67·5	55·7	47·8	45·5	63·9	63·4	61·5	61·2
			Paddy (Un-irrigated)					
1. No. for whom crop relevant	463	523	471	474	910	959	902	913
2. % using fertilisers only	0·9	1·5	1·1	1·3	3·8	4·9	5·5	6·0
3. % using fertilisers & manures	11·0	13·4	18·9	17·3	4·4	4·9	5·5	6·0
4. % using manures only	80·9	74·7	76·2	78·9	49·9	54·3	57·5	56·7
			Wheat (Irrigated)					
1. No. for whom crop relevant	289	308	313	310	541	569	577	598
2. % using fertilisers only	22·8	24·0	34·8	45·8	7·2	10·4	13·8	14·4
3. % using fertilisers & manures	4·5	5·2	11·2	12·9	4·6	5·8	6·4	7·2
4. % using manures only	30·4	28·6	26·8	18·4	29·9	29·5	30·0	29·6
			Sugar-cane (Irrigated)					
1. No. for whom crop relevant	173	184	184	174	267	282	299	298
2. % using fertilisers only	7·5	9·2	7·6	11·5	7·1	7·8	6·0	6·0
3. % using fertilisers & manures	62·4	64·7	65·2	67·2	25·8	26·2	32·1	32·6
4. % using manures only	28·9	25·5	25·5	14·9	64·4	64·9	59·9	63·8
			Groundnut (Un-irrigated)					
1. No. for whom crop relevant	53	51	50	56	173	187	186	186
2. % using fertilisers only	39·6	43·1	52·0	46·4	1·2	6·4	9·7	17·7
3. % using fertilisers & manures	..	..	2·0	1·8	3·5	4·3	5·9	6·6
4. % using manures only	30·2	27·5	26·0	21·4	42·2	40·6	39·8	34·3

Paddy

TABLE 6.9

Percentage of respondents reporting use of fertilisers only, fertilizers and manure and manure only Statewise and cropwise during 1962-63

State	Irrigated							
	Package				Non-Package			
	No. for whom crop is relevant	Proportion using fertiliser only	Proportion using fertiliser & manure	Proportion using manure only	No. for whom crop is relevant	Proportion using fertiliser only	Proportion using fertiliser & manure	Propor tion using manure only
1	2	3	4	5	6	7	8	9
Andhra Pradesh	102	43·1	82·4	52·9	223	4·5	63·7	57·8
Assam	Nil	..	..	..	Nil	..	..	..
Bihar	89	9·0	80·9	11·2	14	14·3	Nil	85·7
Gujarat	7	Nil	71·4	28·6	Nil	..	..	..
J & K	68	4·4	75·0	69·1	NR	..	..	NR
Kerala	66	43·9	66·7	6·1	49	Nil	28·6	91·8
Madhya Pradesh	90	3·3	24·4	78·9	107	4·7	44·9	66·4
Madras	118	10·2	89·8	21·2	99	17·2	50·5	63·6
Maharashtra	90	Nil	27·8	76·7	Nil	..	..	..
Mysore	128	7·8	88·3	16·4	133	7·5	39·8	54·9
Orissa	37	13·5	24·3	97·3	111	1·8	18·9	90·1
Punjab	Nil	..	..	..	17	29·4	5·9	11·8
Rajasthan	Nil	..	..	..	21	17·4	4·8	14·3
U. P.	3	33·3	Nil	Nil	43	30·2	16·3	27·9
W.A.	112	7.1	50·0	67·0	Nil	..	..	..
H.P.	NR	..	..	NR	33	3.0	3·0	30·0
All States	910	13·0	64·6	45.5	850	9.4	39.8	61·1

TABLE 6.9—*Contd.*

Paddy

State	Unirrigated							
	Package				Non-package			
	No. for whom crop is relevant	Proportion using fertiliser only	Proportion using fertiliser and manure	Proportion using manure only	No. for whom crop is relevant	Proportion using fertiliser only	Proportion using fertiliser & manure	Proportion using manure only
1	10	11	12	13	14	15	16	17
Andhra Pradesh	Nil	..	..	...	Nil	..	...	..
Assam	133	Nil	6·8	78·2	82	Nil	Nil	68·3
Bihar	34	Nil	32·4	67·6	97	22·7	Nil	52·6
Gujarat	74	2·7	31·1	62·2	Nil	..	...	..
J & K	Nil	..	..	...	NR	NR	NR	NR
Kerala	8	37·5	75·0	Nil	55	1·8	23·6	85·5
Madhya Pradesh	56	Nil	10·7	83·9	109	4·6	12·8	73·4
Madras	Nil	..	..	...	2	Nil	100·0	Nil
Maharashtra	16	Nil	37·5	62·5	98	10·2	7·1	32·7
Mysore	Nil	..	..	..	131	Nil	4·6	94·7
Orissa	79	Nil	7·6	97·5	49	Nil	Nil	67·3
Punjab	Nil	..	..	...	Nil	..	..	..
Rajasthan	Nil	..	...	...	Nil	..	..	...
U. P.	Nil	..	...	...	128	14·8	10·2	35·9
W.B.	73	1·4	20·5	91·8	139	0·7	Nil	32·4
H. P.	NR	NR	NR	NR	21	23·8	Nil	19·0
All States	**473**	**1·3**	**17·3**	**79·1**	**911**	**6·9**	**6·0**	**56·8**

TABLE 6.9—*Contd.*

State	Wheat (Irrigated)							
	Package				Non-Package			
	No. for whom crop is relevant	Proportion using fertiliser only	Proportion using fertiliser & manure	Proprotion using manure only	No. for whom crop is relvant	Proportion using fertiliser	Proportion using fertiliser & manure	Proportion manure only
1	2	3	4	5	6	7	8	9
Andhra Pradesh	Nil	..	...	...	1	Nil	100·0	Nil
Bihar	64	73·4	Nil	Nil	Nil	...	..	..
Gujarat	3	Nil	Nil	Nil	39	10·3	28·2	48·7
Kerala	Nil	...	—	..	Nil	..	..	..
M. P.	Nil	...	..	...	125	6·4	3·2	47·2
Madras	Nil	..	..	..	Nil	..	..	..
Maharashtra	2	Nil	Nil	Nil	2	50·0	50·0	50·0
Mysore	Nil	..	..	...	Nil	...	..	..
Orissa	Nil	..	..	..	Nil	...	..	..
Punjab	100	65·0	19·0	7·0	107	6·5	1·9	20·6
Rajasthan	48	10·4	18·8	83·3	128	18·8	3·9	35·2
U. P.	77	28·6	5·2	6·5	181	23·2	10·5	14·9
W. B.	16	18·8	50·0	31·3	Nil	..	..	..
H. P.	NR	NR	NR	NR	15	Nil	Nil	26·7
All States	310	45·8	12·9	18·4	598	14·4	7·2	29·6

TABLE 6.9—*Contd.*

State	Sugarcane (Irrigated)							
	Package				Non-Package			
	No. for whom crop is relevant	Proportion using fertiliser only	Proportion using fertiliser & manure	Proportion using manure only	No. for whom crop is relevant	Proportion using fertiliser only	Proportion using fertiliser & manure	Proportion using manure only
1	10	11	12	13	14	15	16	17
Andhra Pradesh	11	72·7	36·4	9·1	13	Nil	30·8	76·9
Bihar	8	25·0	75·0	Nil	Nil	..	..	..
Gujarat	7	14·3	57·1	28·6	5	Nil	20·0	80·0
Kerala	9	11·1	100·0	Nil	1	Nil	100·0	Nil
M. P.	Nil	..	..	..	4	Nil	25·0	Nil
Madras	Nil	..	..	..	Nil	..	..	..
Maharashtra	Nil	..	..	..	Nil	..	..	..
Mysore	36	Nil	97·2	2·8	20	30·0	70·0	Nil
Orissa	7	Nil	42·9	51·9	Nil	..	..	..
Punjab	13	7·7	76·9	23·1	59	1·7	32·2	61·0
Rajasthan	Nil	..	..	..	32	9·4	31·3	62·5
U. P.	32	21·9	9·4	21·9	164	4·9	28·7	73·2
W. B.	51	Nil	84·3	15·7	Nil	..	..	..
H. P.	NR	NR	NR	NR	Nil	..	..	..
All States	174	11·5	67·2	14·9	298	6·0	32·6	63·8

TABLE 6.9—*Contd.*

State	Groundnut (Un-irrigated)							
	Package				Non-Package			
	No. of whom crop is relevant & manure	Proportion using fertiliser only	Proportion using fertiliser & manure	Proportion using manure only	No. for whom crop is relevant & manure	Proportion using fertiliser only	Proportion using fertiliser & manure	Proportion using manure only
1	18	19	20	21	22	23	24	25
Andhra Pradesh	Nil	..	..	..	34	8·8	8·8	14·7
Bihar	Nil	..	..	..	Nil	..	..	..
Gujarat	19	Nil	5·3	31·6	54	20·4	7·4	37·0
Kerala	Nil	..	..	..	Nil	..	..	..
M. P.	Nil	..	..	..	50	40·0	6·0	60·0
Madras	Nil	..	..	..	11	Nil	Nil	72·7
Maharashtra	Nil	..	..	..	40	2·5	5·0	5·0
Mysore	Nil	..	..	..	9	Nil	11·1	33·3
Orissa	6	Nil	Nil	100·0	Nil	..	..	..
Punjab	31	83·9	Nil	Nil	Nil	..	..	..
Rajasthan	Nil	..	..	..	Nil	..	..	..
U. P.	Nil	..	..	..	Nil	..	..	..
W. B.	Nil	..	..	..	Nil	..	..	..
H. P.	Nil	..	..	..	Nil	..	..	..
All States	..	46·4	1·8	21·4	198	17·7	6·6	34·3

TABLE 6.10

Percentage of cropped area of the selected respondents imported with fertilizer and manure during 59-60 to 62-63

Details	Type of crop	Package				Non-Package			
		59-60	60-61	61-62	62-63	59-60	60-61	61-62	62-63
1	2	3	4	5	6	7	8	9	10
				Paddy					
1. Total cropped area . .	Irrigated	1694·8	1687·4	1733·8	1712·1	1108·5	1133·0	1157·1	1150·2
2. % using fertilisers only .	Irrigated	10·3	10·0	13·5	10·0	8·2	7·7	8·0	8·0
3. % using fertilisers & manure	Irrigated	34·1	42·3	50·6	53·8	32·0	37·6	39·8	42·4
4. % using manure only . .	Irrigated	49·0	41·0	30·5	29·3	52·4	48·2	44·3	43·2
				Paddy					
1. Total cropped area . .	Unirrigated	566·7	582·6	576·8	588·1	954·3	947·4	961·2	965·7
2. % using fertilisers only .	Unirrigated	0·3	0·4	0·3	0·4	2·2	3·2	3·2	3·6
3. % using fertilisers & manure .	Unirrigated	8·1	10·5	14·9	12·4	4·3	5·7	4·6	4·7
4. % using manures only .	Unirrigated	58·2	61·0	45·2	53·0	34·0	39·9	39·9	39·2
				Wheat					
1. Total corpped area . .	Irrigated	523·7	532·4	543·5	540·3	513·3	541·1	560·4	577·7
2. % using fertilisers only	Irrigated	19·2	20·9	28·8	42·8	9·6	11·5	13·1	13·7
3. % using fertilisers & manure	Irrigated	4·8	4·5	7·3	10·0	3·1	3·7	8·2	5·3
4. % usin g manures only . .	Irrigated	26·0	27·6	22·6	17·6	21·3	21·5	22·1	22·5
				Sugarcane					
1. Total cropped area . .	Irrigated	86·2	85·3	88·5	80·7	168·6	173·5	184·1	175·8
2. % using fertilisers only .	Irrigated	19·2	20·9	28·8	42·8	9·6	11·5	13·1	13·7
3. % using fertilisers & manure	Irrigated	43·5	49·5	60·1	56·1	40·5	38·6	41·7	42.3
4. % using manures only . .	Irrigated	37·0	27·8	24·7	8·1	45·1	45·2	44·9	45.3
				Groundnut					
1. Total corpped area . .	Unirrigated	..	..	98·6	115·1	...	..	431·9	544·8
2. % using fertilisers only .	Unirrigated	..	..	69·0	63·8	...	..	7·9	9·5
3. % using fertilisers & manure	Unirrigated	..	..	1·2	0·9	..	..	3·8	3·8
4. % using manures only . .	Unirrigated	..	..	13·5	10·9	..	..	30·5	21·3

TABLE No. 6.11

Percentage of total cropped area of the respondent treated with fertilisers and/or manures durind 62-63, *Statewise*

State	Type of Distt.	Paddy							
		Irrigated				Unirrigated			
		Total cropped area	% area treated with fertiliser only	% area treated with fertiliser and manures	% area treated with manures only	Total cropped area	% area treated with fertiliser only	% area treated with fertiliser and manures	% area treated with manures only
1	2	3	4	5	6	7	8	9	10
A. P.	P	293·0	20·1	45·3	27·4	Nil	..	..	..
	NP	287·0	2·7	53·9	34·0	1·6	Nil	..	..
Assam	P	Nil	..	..	..	Nil	Nil	Nil	Nil
	NP	Nil	..	..	..	62·8	Nil	Nil	35·5
Bihar	P	163·1	4·8	90·0	5·2	48·5	Nil	4·4	55·5
	NP	14·5	23·4	Nil	13·8	103·5	6·9	Nil	9·1
Gujarat	P	6·4	Nil	82·8	17·2	59·4	2·4	38·2	54·4
	NP	Nil	..	..	..	0·7	Nil	Nil	Nil
J & K	P	81·2	1·1	46·4	44·9	Nil	..	..	..
	NP	NR	NR	NR	NR	NR	NR	NR	NR
Kerala	P	229·4	29·2	66·3	3·0	2·2	50·0	50·0	Nil
	NP	60·8	Nil	25·3	73·2	73·9	0·1	10·4	77·7
M. P.	P	168·7	1·9	23·6	47·5	89·3	Nil	9·9	59·9
	NP	174·1	4·0	38·7	51·5	107·7	1·7	7·5	54·3
Madras	P	253·0	8·5	71·7	18·4	Nil	..	..	..
	NP	315·7	15·9	53·6	30·1	3·4	Nil	100·0	Nil
Maharashtra	P	144·8	Nil	22·4	74·6	20·5	Nil	39·0	60·5
	NP	Nil	..	..	..	130·1	13·1	11·1	28·5
Mysore	P	133·8	4·0	83·0	13·0	Nil	..	..	..
	MP	109·2	7·5	49·1	43·5	139·6	Nil	3·9	95·6
Orissa	P	37·6	5·6	4·8	84·0	89·5	Nil	1·6	89·5
	NP	128·4	0·2	14·3	82·1	60·1	Nil	Nil	24·6

TABLE 6.11—*Contd.*

1	2	3	4	5	6	7	:	9	10
Punjab	P	Nil	Nil	Nil	Nil	Nil	..	..	..
	NP	6·2	22·6	9·7	8·1	Nil	..	..	..
Rajasthan	P	Nil	Nil	Nil	Nil	Nil	..	..	..
	NP	12·5	64·8	2·4	8·0	Nil	..	..	..
U. P.	P	1·2	50·0	Nil	Nil	0·9	Nil	Nil	Nil
	NP	20·0	24·0	16·5	26·5	72·5	10·3	9·2	24·0
W. B.	P	199·9	1·5	40·1	42·2	73·7	0·1	12·6	79·6
	NP	Nil	..	..	..	203·4	0·1	Nil	14·8
H. P.	P	NR	NR	NR	NR	NR	NR	NR	NR
	NP	11·1	3·6	0·4	18·9	6·4	14·1	Nil	17·2
All States	P	1712·1	10·0	53·8	29·3	588·1	0·4	12·4	53·0
	NP	1150·2	8·0	42·4	43·1	965·7	3·6	4·7	39·5

TABLE 6.11—*Contd.*

State	Type of Dist.	Wheat				Sugarcane				Groundnut (unirrigated)			
		Total cropped area (irr.)	% area treated with fert. only.	% area treated with fert. & manure	% area treated with manure	Total cropped area (irr.)	% area treated with fert. only.	% area treated with fert. & manure	% area treated with manure	Total cropped area	% area treated with fert. only.	% area treated with fert. & manure	% area treated with manure
1	2	3	4	5	6	7	8	9	10	11	12	13	14
A. P.	P	Nil	..	..	..	9·3	69·9	16·1	4·3	Nil	..	..	..
	NP	0·8	Nil	100·0	Nil	8·0	Nil	60·0	37·5	37·6	2·7	4·5	8·8
Bihar	P	67·5	73·0	Nil	Nil	5·7	28·1	71·9	Nil	Nil	..	..	..
	NP	Nil	..	..	..	Nil	..	..	..	Nil	..	..	..
Gujarat	P	0·7	Nil	Nil	Nil	18·9	49·0	46·0	5·0	20·5	Nil	4·9	52·7
	NP	40·4	4·7	29·7	61·4	1·0	Nil	10·0	90·0	303·7	7·2	4·3	16·1
Kerala	P	Nil	..	..	..	2·7	22·2	77·8	Nil	Nil	..	..	..
	NP	Nil	..	..	..	0·04	Nil	100·0	Nil	Nil	..	..	..
M. P.	P	Nil	..	..	..	Nil	..	..	..	Nil	..	..	..
	NP	113·5	4·4	2·0	42·0	0·9	Nil	44·4	Nil	80·8	34·3	3·2	60·3
Madras	P	Nil	..	..	..	Nil	..	..	..	Nil	..	..	..
	NP	Nil	..	..	..	Nil	..	..	..	12·0	Nil	Nil	90·8
Maharashtra	P	0·7	Nil	Nil	Nil	Nil	..	..	Nil	Nil	..	..	..
	NP	0·8	25·0	25·0	50·0	Nil	..	..	..	85·1	0·9	2·8	2·4
Mysore	P	Nil	..	..	..	17·7	Nil	98·9	1·1	Nil	..	..	..
	NP	Nil	..	..	..	16·1	46·6	53·4	Nil	25·6	Nil	2·3	9·4
Orissa	P	Nil	..	..	..	0·7	Nil	28·6	71·4	1·7	Nil	Nil	100·0
	NP	Nil	..	..	..	Nil	..	..	..	Nil	..	..	..
Punjab	P	251·9	59·4	16·8	3·5	7·5	2·7	84·0	13·3	92·9	79·0	Nil	Nil
	NP	119·5	5·8	0·8	15·6	18·0	0·6	36·1	57·2	Nil	..	..	..
Rajasthan	P	96·7	4·9	8·6	84·8	Nil	..	..	..	Nil	..	..	..
	NP	159·9	24·8	2·9	15·8	12·6	6·3	34·9	55·6	Nil	..	..	..
U. P.	P	121·0	22·6	2·2	3·1	14·5	15·2	12·4	20·0	Nil	..	..	..
	NP	139·9	18·3	7·1	8·9	119·2	7·0	41·5	49·0	Nil	..	..	..
W. B.	P	1·8	22·8	38·9	38·9	3·7	Nil	83·8	13·5	Nil	..	..	..
	NP	Nil	..	..	..	Nil	..	..	..	Nil	..	..	..
H. P.	P	NR	NR	NR	NR	NR	NR	NR	NR	Nil	..	..	..
	NP	3·9	Nil	Nil	17·9	Nil	..	..	..	Nil	..	..	..
All States	P	540·3	42·8	10·0	17·6	80·7	25·3	56·1	8·1	115·1	63·8	0·9	10·9
	NP	577·7	13·7	5·3	22·5	175·8	9·5	42·3	45·3	544·8	9·5	3·8	21·3

TABLE No. 6.12

Statement showing the area treated and per hectare use of N-fertilisers by selected respondents for various Crops State-wise

State	Type of Dist.	Paddy							
		1959-60		1960-61		1961-62		1962-63	
		Area treated	Per hectare use	Area treated	Per hectare use	Area treated	Per hectare use	Area treated	Per hectare use
1	2	3	4	5	6	7	8	9	10
A. P.	P	120·8	18·3	152·9	21·1	186·4	21·0	205·0	18·9
	NP	76·8	19·8	111·9	20·0	132·7	30·0	140·8	26·7
Assam	P	Nil	..	0·3	19·7	0·3	34·5	0·1	25·0
	NP	Nil	..	0·1	44·1	Nil	..	Nil	..
Bihar	P	121·3	13·2	133·7	11·0	120·2	18·2	115·4	18·5
	NP	1·7	12·0	2·5	12·1	6·8	11·9	13·2	12·6
Gujarat	P	17·2	22·6	19·6	46·1	22·1	38·0	25·1	48·7
	NP	Nil	..	Nil	..	Nil	..	Nil	..
J. & K.	P	13·1	49·8	19·5	39·4	29·9	31·6	33·8	29·9
	NP	NR	..	..	..	..	..	..	..
Kerala	P	116·8	9·8	147·7	11·5	148·7	22·9	142·4	15·3
	NP	5·7	85·5	9·7	24·7	11·5	53·5	7·9	27·4
M. P.	P	37·9	15·2	46·6	16·3	86·5	14·8	38·0	19·5
	NP	52·9	16·4	60·7	16·2	68·4	16·7	67·2	15·8
Madras	P	65·6	9·6	138·0	12·1	170·2	15·6	181·4	16·5
	NP	67·3	23·7	61·3	20·5	94·6	33·2	74·8	23·3
Maharashtra	P	42·5	17·6	53·2	15·4	58·7	16·6	44·8	18·1
	NP	25·4	13·7	33·4	13·9	32·3	13·8	29·5	12·1
Mysore	P	74·9	30·4	83·2	30·1	95·7	27·5	117·9	26·2
	NP	43·2	47·0	55·0	47·2	56·4	30·7	65·7	29·9
Orissa	P	0·8	25·6	1·9	17·0	2·1	28·0	6·2	45·3
	NP	9·0	6·2	14·3	4·7	15·1	4·4	13·5	4·9
Punjab	P	Nil	..	Nil	..	Nil	..	Nil	..
	NP	1·2	25·6	1·1	26·1	1·3	26·0	1·4	24·9

Rajasthan	P	Nil	..	Nil	..	Nil	..	Nil	..
	NP	3·4	22·9	6·2	24·3	5·4	34·4	7·3	34·2
U. P.	P	Nil	..	Nil	..	0·9	7·2	0·6	6·4
	NP	13·1	8·7	15·8	10·2	12·9	8·2	17·5	9·2
West Bengal	P	45·9	9·3	54·0	9·1	82·1	6·6	73·6	7·8
	NP	Nil	..	1·6	52·8	Nil	..	0·1	32·1
H. P.	P	NR	..	..	..	..	..	..	
	NP	0·3	5·4	0·9	10·9	0·7	8·1	1·4	10·9
All States	P	656·4	16·2	850·7	16·9	1003·8	19·2	984·5	19·2
	NP	300·2	23·8	374·5	22·4	438·1	26·3	440·4	22·3

TABLE 6.12—*Contd.*

State	Type of Dist.	Wheat							
		1959-60		1960-61		1961-62		1962-63	
		Area treated	Per hectare	Area hectare treated	Per hectare use	Area hectare treated	Per hectare use	Area treated	Per hectare use
1	2	11	12	13	14	15	16	17	18
A.P.	P	Nil	..	Nil	..	Nil	..	Nil	..
	NP	0·1	20·5	1·1	31·7	0·9	25·0	0·9	21·8
Assam	P	Nil	..	..	..	..	..	..	..
	NP	Nil	..	..	..	..	..	..	..
Bihar	P	26·8	10·7	27·3	10·9	46·2	11·1	31·5	30·0
	NP	Nil	..	Nil	..	Nil	..	Nil	..
Gujarat	P	Nil	..	Nil	..	Nil	..	Nil	..
	NP	3·2	11·7	2·6	16·3	1·7	28·5	Nil	..
J. & K.	P	Nil	..	Nil	..	Nil	..	Nil	..
	NP	..	..	..	..	..	..	..	..
Kerala	P	Nil	..	..	..	..	..	..	..
	NP	Nil	..	..	..	..	..	..	..
M.P.	P	Nil	..	..	..	..	..	..	..
	NP	3·1	11·5	0·9	12·5	5·8	19·0	5·7	24·4
Madras	P	Nil	..	..	..	..	..	..	..
	NP	Nil	..	..	..	..	..	..	..
Maharashtra	P	Nil	..	..	..	..	..	..	..
	NP	0·4	25·6	0·4	25·6	1·6	38·5	0·4	25·6
Mysore	P	Nil	..	..	..	..	..	..	..
	NP	..	..	..	..	..	..	..	..
Orissa	P	Nil	..	..		..	..	..	..
	NP	Nil	..	..	..	..	..	..	..
Punjab	P	73·4	25·2	83·0	24·9	110·4	27·7	188·4	21·5
	NP	0·6	34·2	0·8	44·8	1·0	41·0	28·3	8·7
Rajasthan	P	0·3	64·1	0·8	2·5	3·9	25·1	11·0	19·1
	NP	19·4	15·6	32·6	17·9	37·1	18·2	41·4	17·7

U. P.	P	6·7	73·6	4·0	9·8	13·0	11·1	29·7	7·2
	NP	15·7	9·7	20·1	11·5	20·5	11·2	22·4	10·9
W. B.	P	0·1	47·1	0·2	29·0	0·4	41·0	0·5	39·7
	NP	Nil	..	..	..	..	..	..	..
H. P.	P	..	..	..	..	..	..	..	..
	NP	Nil	..	Nil	..	0·9	2·5	1·3	0·3
All States	P	107·3	24·7	115·4	20·9	173·6	22·0	261·1	20·5
	NP	42·5	13·2	58·4	16·2	69·5	17·1	100·3	13·9

TABLE No. 6.12—*Contd.*

Sugarcane

1	2	3	4	5	6	7	8	9	10
A.P.	P	3·5	65·0	5·6	108·0	5·6	125·5	9·6	95·0
	NP	6·6	18·5	7·6	25·8	8·4	32·0	6·8	25·0
Bihar	P	5·4	16·6	4·6	27·1	2·8	32·9	4·6	32·9
	NP	Nil	..	Nil	..	Nil	..	Nil	..
Gujarat	P	2·1	55·4	5·2	81·4	12·6	80·8	40·5	55·0
	NP	Nil	..	Nil	..	Nil	..	Nil	..
Kerala	P	0·9	371·1	1·0	71·0	0·8	81·5	10·8	47·3
	NP	Nil	..	Nil	..	Nil	..	Nil	..
M. P.	P	Nil	..	Nil	..	Nil	..	Nil	..
	NP	Nil	..	Nil	..	Nil	..	0·4	28·1
Maharashtra	P	..	..	..	..	..	..	..	..
	NP	..	..	..	..	..	..	..	..
Mysore	P	16·9	185·3	17·9	172·0	18·2	179·3	17·4	185·5
	NP	13·1	98·0	16·0	95·1	16·0	86·5	17·4	85·6
Orissa	P	Nil	..	0·03	13·7	0·1	11·0	0·2	13·7
	NP	Nil	..	Nil	..	Nil	..	Nil	..
Punjab	P	4·9	38·7	6·0	36·7	6·2	37·2	7·6	30·6
	NP	1·9	36·4	3·6	40·2	4·3	45·9	5·1	35·1
Rajasthan	P	Nil	..	Nil	..	Nil	..	Nil	..
	NP	2·0	47·4	2·5	45·0	4·0	28·8	5·4	29·0
U.P.	P	3·0	11·4	3·9	14·4	5·1	13·5	3·8	15·1
	NP	54·2	19·7	54·9	19·9	51·0	20·4	54·8	20·7
W.B.	P	1·9	32·8	2·4	26·8	2·4	27·7	2·3	27·7
	NP	1·4	416·3	0·2	40·5	0·3	41·7	0·4	84·4
H.P.	P	NR	NR	NR	NR	NR	NR	NR	NR
	NP	Nil	..	0·6	0·3	Nil	..	Nil	..
All States	P	38·5	108·3	46·7	99·5	53·8	102·5	96·9	76·5
	NP	78·1	35·8	86·7	36·0	84·0	34·8	90·4	35·2

TABLE No. 6·12—*contd.*

Groundnut

1	2	11	12	13	14	15	16	17	18
A. P.	P	Nil	..	Nil	..	2·0	15·4	Nil	..
	NP	0·7	12·3	Nil	..	Nil	..	0·1	14·5
Bihar	P	..	..	..	..	..	..	..	..
	NP	..	..	..	..	..	..	..	..
Gujarat	P	3·3	6·9	2·8	16·4	Nil	..	Nil	..
	NP	Nil	..	1·6	23·7	Nil	..	1·2	23·9
Kerala	P	..	..	..	..	..	..	..	..
	NP	..	..	..	..	..	..	..	..
M. P.	P	Nil	..	Nil	..	Nil	..	Nil	..
	NP	0·6	8·5	0·9	18·6	0·7	73·8	5·8	83·9
Maharashtra	P	Nil	..	Nil	..	Nil	..	Nil	..
	NP	3·2	11·9	3·2	11·9	3·2	11·9	4·9	12·1
Mysore	P	Nil	..	Nil	..	Nil	..	Nil	..
	NP	Nil	..	1·6	51·2	1·6	51·2	1·6	51·2
Orissa	P	0·2	22·8	0·2	22·8	0·2	22·8	0·2	22·8
	NP	Nil	..	Nil	..	Nil	..	Nil	..
Punjab	P	48·4	20·8	48·4	22·0	61·2	26·9	69·4	19.1
	NP	Nil	..	Nil	..	11·6	53·4	Nil	..
Rajasthan	P	..	..	..	..	..	..	..	..
	NP	..	..	..	..	..	..	..	..
W. B.	P	..	..	..	..	..	..	..	..
	NP	..	..	..	..	..	..	..	..
H. P.	P	NR	NR	NR	NR	NR	NR	NR	NR
	NP	Nil	..	Nil	..	Nil	..	Nil	..
All States	P	51·9	19·9	51·4	21·7	63·4	26·5	69·6	19·1
	NP	4·5	11·5	7·3	23·9	11·6	53·4	13·6	48·5

TABLE No. 6·13

Particulars of quantity of nitrogenous fertilisers used in 1962-63 *and in the year of first adoption by selected respondents by categories and periods of first adoptian*

(Qty. in kgs.)

Category of respondents	Package								
	1950-51 or before			1951-52 to 1955-56			1956-57 to 1960-61		
	No. of users	Qty. used in the first year of use	Qty. used by them in 62-63 (%age growth)	No. of users	Qty. used in the first year of use	Qty. used by them in 62-63 (%age growth)	No. of users	Qty. used in the first year of use	Qty. used by them in 62-63 (%age growth)
1	2	3	4	5	6	7	8	9	10
Owners	127	26,145·0	135·9	97	13,506·1	212·3	294	28,227·9	153·7
Tenants	4	639·0	432·1	12	959·0	246·2	34	3,086·5	62·8
Others	6	756·0	212·7	2	210·0	(—)76·2	18	1,377·7	318·9
Total	137	27,540·0	144·8	111	14,675·1	210·4	346	32,692·1	152·4

Non-Package

Category of respondents	No. of users	Qty. used in the first year of use	Qty. used by them in 62-63 (%age growth)	No. of users	Qty. used in the first year of use	Qty. used by them in 62-63 (%age growth)	No. of users	Qty. used in the first year of use	Qty. used by them in 62-63 (%age growth)
1	11	12	13	14	15	16	17	18	19
Owners	60	7,274·8	111·7	89	10,636·7	79·1	317	32,090·2	27·9
Tenants	9	1,529·3	(—)8·8	9	310·4	245·3	22	891·6	44·8
Others	1	200·0	0·0	2	200·0	170·7	21	933·0	(—)11·4
Total	70	9,004·1	86·5	100	11,147·1	85·4	360	33,914·8	27·3

TABLE No. 6·14

Percentage of respondents reporting the use of combination of manures and fertilisers and the percentage of cropped area covered during 62-63, cropwise and Statewise

Paddy (Irrigated)

State	Type of Distt.	No. of relevant respon-dents	Croup area	Use of fertilisers and Compost/FYM		Use of fertilisers and Green Manure		Use of fertilisers compost/FYM & Green Manure	
				No. of respon-dents (% to col. 3)	Area treated (% to col. 4)	No. of respon-dents (% to col. 3)	Area treated (% to col. 4)	No. of respon-dents (% to col. 3)	Area treated (% to col. 4)
1	2	3	4	5	6	7	8	9	10
A. P.	P	98	279·7	89·7	87·6	34·6	50·1	36·7	52·0
	NP	192	253·4	54·1	52·8	4·6	9·2	18·2	24·7
Assam	P	Nil	..	..	..	..	..	..	..
	NP	Nil	..	..	..	..	..	..	..
Bihar	P	89	163·1	80·8	90·8	Nil	..	Nil	..
	NP	11	13·1	Nil	..	Nil	..	Nil	..
Gujarat	P	7	6·4	71·4	83·3	14·2	7·5	28·5	36·2
	NP	Nil	..	..	..	..	..	..	..
J& K	P	50	58·2	84·0	85·5	Nil	..	Nil	..
	NP	NR	..	..	..	..	..	..	..
Kerala	P	65	219·0	49·2	66·7	1·5	1·6	3·0	1·7
	NP	49	60·9	28·5	47·4	24·4	43·0	24·4	43·0
M. P.	P	79	144·4	26·5	37·6	2·5	4·2	25·3	37·1
	NP	77	119·9	50·6	67·7	3·8	6·7	41·5	61·9
Madras	P	100	211·2	90·0	80·1	88·0	87·0	88·0	87·0
	NP	99	315·7	52·5	78·3	12·1	19·9	13·1	20·8
Maharashtra	P	84	131·8	26·1	24·9	Nil	..	26·1	24·9
	NP	Nil	..	..	..	..	..	..	..
Mysore	P	98	106·5	29·5	26·9	78·5	86·0	80·6	87·0
	NP	102	93·4	44·1	60·1	13·7	18·3	15·6	20·2

TABLE No. 6·14—*contd.*

1	2	3	4	5	6	7	8	9	10
Orissa	P	36	37·2	36·1	48·0	5·5	12·6	5·5	12·6
	NP	81	104·0	19·7	30·0	8·6	20·8	9·8	22·3
Punjab	P	Nil	..	..	..	..	..	..	..
	NP	12	4·0	Nil	..	Nil	..	Nil	..
Rajasthan	P	Nil	..	..	..	..	..	..	..
	NP	20	11·5	5·0	2·1	Nil	..	Nil	..
U. P.	P	3	1·2	Nil	..	Nil	..	Nil	Nil
	NP	43	20·0	18·6	21·6	Nil	..	13·9	17·4
W. B.	P	81	154·5	48·1	55·8	2·4	1·5	25·9	27·3
	NP	Nil	..	..	..	..	..	..	..
H. P.	P	NR	NR	NR	NR	NR	NR	NR	NR
	NP	26	8·2	3·8	0·4	Nil	..	3·8	0·4
All States	P	790	1,513·0	57·3	65·1	26·2	28·6	35·5	38·3
	NP	712	1,003·9	39·3	58·0	8·0	15·8	17·2	27·3

TABLE No. 6·14—*contd.*

Paddy (Unirrigated)

1	2	3	4	5	6	7	8	9	10
A.P.	P	Nil	..	..	..	..	..	..	..
	NP	1	1·6	Nil	..	..	..	..	..
Assam	P	97	161·4	5·1	2·0	0·0	0·0	4·1	1·4
	NP	62	50·0	0·0	0·0	0·0	0·0	0·0	0·0
Bihar	P	34	48·5	23·5	37·9	0·0	0·0	0·0	0·0
	NP	69	78·1	7·2	2·3	0·0	0·0	0·0	0·0
Gujarat	P	74	59·4	29·7	37·3	2·7	3·6	2·7	3·6
	NP	1	0·7	0·0	0·0	0·0	0·0	0·0	0·0
J. & K.	P	Nil	Nil	..	..	..	..	..	..
	NP	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.
Kerala	P	8	2·3	37·5	31·3	0·0	0·0	0·0	0·0
	NP	55	73·9	23·6	19·5	14·5	10·0	14·5	10·0
M.P.	P	49	77·7	12·2	28·0	6·1	16·9	10·2	27·6
	NP	96	94·7	12·4	8·5	0·0	0·0	4·1	4·3
Madras	P	Nil	Nil	..	..	..	..	..	..
	NP	2	3·4	100·0	100·0	0·0	0·0	0·0	0·0
Maharashtra	P	16	20·5	37·5	39·1	0·0	0·0	31·2	37·1
	NP	95	128·9	7·3	10·5	0·0	0·0	0·0	0·0
Mysore	P	Nil	Nil	..	..	..	..	..	..
	NP	93	100·9	5·3	4·8	2·1	3·0	2·1	3·0
Orissa	P	77	87·9	7·7	12·8	5·1	12·0	5·1	12·0
	NP	34	45·7	0·0	0·0	0·0	0·0	0·0	0·0
Punjab	P	Nil	Nil	..	..	..	..	..	..
	NP	Nil	Nil	..	..	..	..	..	..
Rajasthan	P	Nil	Nil	..	..	..	..	..	..
	NP	Nil	Nil	..	..	..	..	..	..
U.P.	P	1	0·9	0·0	0·0	0·0	0·0	0·0	0·0
	NP	15	65·8	13·9	15·8	0·8	5·5	12·1	15·1
W.B.	P	54	57·7	24·0	19·4	0·0	0·0	14·8	10·8
	NP	100	149·7	0·0	0·0	0·0	0·0	0·0	0·0
H.P.	P	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.
	NP	20	6·3	0·0	0·0	0·0	0·0	0·0	0·0
All States	P	410	516·3	16·8	18·7	2·1	5·0	6·8	9·7
	NP	743	799·6	8·0	7·0	1·4	1·7	3·7	3·0

TABLE No. 6·14—*contd.*

Wheat (irrigated)

1	2	3	4	5	6	7	8	9	10
A.P.	P	Nil	..	..	..	..	..	..	..
	NP	1	0·8	100·0	99·9	0·0	0·0	100·0	99·9
Bihar	P	64	67·5	Nil	Nil	..	..	..	..
	NP	Nil	..	..	..	..	..	..	..
Gujarat	P	3	0·7	0·0	0·0	0·0	0·0	0·0	0·0
	NP	39	40·4	28·2	35·5	0·0	0·0	0·0	0·0
M.P.	P	Nil	..	..	..	..	..	..	..
	NP	113	95·3	5·3	7·9	1·7	2·2	3·5	3·0
Maharashtra	P	2	0·7	0·0	0·0	0·0	0·0	0·0	0·0
	NP	2	0·8	0·0	0·0	50·0	50·0	50·0	50·0
Punjab	P	83	207·9	25·3	25·3	1·2	0·7	25·3	25·3
	NP	80	87.0	2·5	2·3	0·0	0·0	2·5	2·3
Rajasthan	P	43	88·4	23·2	18·0	0·0	0·0	16·2	11·3
	NP	114	146·7	4·3	6·3	0·0	0·0	3·5	5·4
U.P.	P	73	115·1	6·8	5·0	1·3	0·4	4·1	1·9
	NP	161	123·1	10·5	7·1	2·4	2·6	19·3	7·1
W.B.	P	13	1·5	23·0	20·9	0·0	0·0	0·0	0·0
	NP	Nil	..	..	..	..	..	..	..
H.P.	P	N.R.	..	..	..	..	..	..	..
	NP	12	3·2	Nil	..	..	..	..	..
All States	P	281	481·8	13·8	15·5	0·7	0·4	11·0	13·4
	NP	522	497·2	8·0	8·6	1·3	1·1	5·1	4·5

TABLE 6·14—*contd.*

Sugarcane (Irrigated)

1	2	3	4	5	6	7	8	9	10
A.P.	P	11	9·3	36·3	39·8	0·0	0·0	0·0	0·0
	NP	13	8·0	15·3	52·9	0·0	0·0	7·6	37·9
Bihar	P	8	5·7	75·0	71·6	0·0	0·0	0·0	0·0
	NP	Nil	..	..	..	..	..	..	..
Gujarat	P	7	18·9	57·1	45·7	14·2	8·9	28·5	17·7
	NP	5	1·0	20·0	8·3	0·0	0·0	0·0	0·0
Kerala	P	9	2·7	100·0	100·0	0·0	0·0	11·1	12·0
	NP	1	0·1	100·0	100·0	0·0	0·0	100·0	100·0
M.P.	P	0	0·9	0·0	0·0	0·0	0·0	0·0	0·0
	NP	4	0·9	25·0	44·4	0·0	0·0	25·0	44·4
Mysore	P	34	16·9	94·1	97·6	5·8	2·9	38·2	50·5
	NP	17	13·3	70·5	49·7	0·0	0·0	0·0	0·0
Orissa	P	7	0·7	42·8	23·0	0·0	0·0	0·0	0·0
	NP	Nil	..	..	..	..	..	..	..
Punjab	P	12	7·0	74·9	85·7	0·0	0·0	74·9	85·7
	NP	45	12·9	31·1	38·0	0·0	0·0	24·4	29·5
Rajasthan	P	Nil	..	..	..	..	..	..	..
	NP	31	12·1	35·4	45·4	0·0	0·0	32·2	43·3
U.P.	P	29	12·3	10·3	13·8	0·0	0·0	0·0	0·0
	NP	163	118·4	30·0	52·2	0·6	1·4	20·8	33·1
W. B.	P	37	2·6	83·7	84·4	0·0	0·0	8·1	7·9
	NP	Nil	..	..	..	..	..	..	..
All States	P	154	76·9	65·5	59·4	1·9	2·8	18·1	23·9
	NP	279	166·6	32·6	50·2	0·3	1·0	20·7	31·0

TABLE NO. 6·14—contd.

Groundnut (Unirrigated)

1	2	3	4	5	6	7	8	9	10
A.P.	P	Nil	..	..	..	..	..	..	..
	NP	29	35·5	10·3	4·6	0·0	0·0	3·4	0·7
Gujarat	P	19	20·5	5·2	4·6	0·0	0·0	0·0	0·0
	NP	53	301·0	11·3	6·9	0·0	0·0	0·0	0·0
M.P.	P	Nil	..	..	..	..	..	..	..
	NP	50	80·0	10·0	12·6	0·0	0·0	10·0	12·6
Madras	P	Nil	..	..	..	..	..	..	..
	NP	11	12·0	Nil	..	..	..	..	..
Maharashtra	P	Nil	..	..	..	..	..	..	..
	NP	35	72·9	5·7	4·4	0·0	0·0	5·7	4·4
Mysore	P	Nil	..	..	..	..	..	..	..
	NP	6	17·8	16·6	5·6	0·0	0·0	0·0	0·0
Orissa	P	6	1·7	Nil	..	..	..	..	..
	NP	Nil	..	..	..	..	..	..	..
Punjab	P	26	76·9	Nil	..	..	..	..	..
	NP	Nil	..	..	..	..	..	..	..
U.P.	P	Nil	..	..	..	..	..	..	..
	NP	1	2·7	Nil	..	..	..	..	..
All States	P	51	99·1	1·9	0·9	0·0	0·0	0·0	0·0
	NP	185	522·8	9·1	7·0	0·0	0·0	4·3	2·6

TABLE No. 6·15

Percentage distribution of respondents according to preferences for various types of fertilisers and manures for specified crops

Paddy (Irrigated)

State	Distt.	Relevant respondents	Proportion of respondents prefering (% to col. 3)			Respondents prefering N. fertilizers	Proportion of respondents preferring N. fertilisers by type (% to col. 7)				
			Chemical fertilizers	Organic Manure	Both/ cannot specify		A.S.	A.S.N.	C.A.N.	Urea	Others
1	2	3	4	5	6	7	8	9	10	11	12
1. A.P. . . .	P	99	4·04	28·28	67·67	94	65·96	3·19	21·28	8·51	1·06
	NP	192	10·41	71·35	18·22	158	70·25	0·63	1·27	27·85	Nil
2. Assam . .	P	Nil	..	..	..	Nil	..	..	..	..	..
	NP	Nil	..	..	..	Nil	..	..	..	..	..
3. Bihar . .	P	96	Nil	100·00	Nil	92	98·91	Nil	Nil	1·09	Nil
	NP	10	80·0	20·00	Nil	8	100·00	Nil	Nil	Nil	Nil
4. Gujarat . .	P	8	Nil	37·50	62·50	6	83·33	Nil	Nil	16·67	Nil
	NP	4	25·0	75·00	Nil	Nil	..	..	..	..	..
5. J. & K. . .	P	50	24·0	44·00	32·00	2	100·00	Nil	Nil	Nil	Nil
	NP	N.R.	..	..	..	..	..	..	..	..	..
6. Kerala . .	P	67	14·9	47·80	37·31	61	19·67	Nil	26·23	54·10	Nil
	NP		7·54	64·15	28·30	19	89·47	Nil	Nil	10·53	Nil
7. M.P. . .	P	80	1·25	97·50	1·25	41	70·73	Nil	Nil	29·27	Nil
	NP	85	8·23	82·35	9·41	81	96·29	Nil	1·24	2·47	Nil
8. Madras . .	P	99	Nil	97·97	2·02	90	83·33	Nil	1·11	15·26	Nil
	NP	92	Nil	63·04	36·95	82	96·34	Nil	Nil	3·66	Nil

TABLE No. 6·15—*contd.*

1	2	3	4	5	6	7	8	9	10	11	12
9. Maharashtra .	P	78	1·28	92·30	6·41	62	100·00	Nil	Nil	Nil	Nil
	NP	2	50·00	50·00	Nil	1	100·00	Nil	Nil	Nil	Nil
10. Mysore . .	P	96	Nil	86·45	13·54	80	88·75	Nil	1·25	10·00	Nil
	NP	103	19·41	69·90	10·67	63	58·73	Nil	3·17	38·10	Nil
11. Orissa . .	P	30	3·33	73·33	23·33	12	100·00	Nil	Nil	Nil	Nil
	NP	96	5·20	88·54	6·25	45	95·56	2·22	2·22	Nil	Nil
12. Punjab . .	P	Nil	..	..	..	..	..	..	..	..	..
	NP	25	8·00	92·00	Nil	10	20·00	Nil	80·00	Nil	Nil
13. Rajasthan . .	P	Nil	..	..	..	..	..	..	..	..	..
	NP	20	Nil	100·00	Nil	19	Nil	Nil	Nil	100·00	Nil
14. U.P. . .	P	11	Nil	100·00	Nil	6	83·33	Nil	16·67	Nil	Nil
	NP	64	Nil	96·87	3·12	38	68·43	2·63	23·68	5·26	Nil
15. W.B. . .	P	78	Nil	57·69	42·30	38	100·00	Nil	Nil	Nil	Nil
	NP	Nil	..	..	..	..	..	..	..	..	..
16. H.P. . .	P	N.R.	..	..	..	N.R.	..	..	..	..	
	NP	39	Nil	100·00	Nil	6	66·67	Nil	33·33	Nil	
All States . .	P	792	3·71	74·4	22·0	584	79·45	0·51	6·68	13·19	0·17
	NP	785	8·71	77·2	14·1	530	76·60	0·57	4·72	18·11	Nil

TABLE NO. 6·15—*contd.*

Paddy (Unirrigated)

1	2	3	4	5	6	7	8	9	10	11	12
1. A.P. . . .	P	Nil	..	..	..	..	..	..	..	..	..
	NP	1	100·00	Nil	Nil	1	Nil	Nil	Nil	100·00	Nil
2. Assam . .	P	16	6·25	25·00	68·75	4	Nil	100·00	Nil	Nil	Nil
	NP	24	Nil	66·66	33·33	2	100·00	Nil	Nil	Nil	Nil
3. Bihar . .	P	4	Nil	100·00	Nil	3	100·00	Nil	Nil	Nil	Nil
	NP	69	81·15	18·84	Nil	61	100·00	Nil	Nil	Nil	Nil
4. Gujarat . .	P	68	2·94	60·29	36·76	23	100·00	Nil	Nil	Nil	Nil
	NP	Nil	..	..	..	..	..	..	..	..	..
5. J. & K. . .	P	Nil	..	..	..	..	..	..	..	..	..
	NP	N.R.	..	..	..	N.R.	..	..	..	..	..
6. Kerala . .	P	6	33·33	33·33	33·33	5	80·00	Nil	Nil	20·00	Nil
	NP	42	4·76	61·90	33·33	10	90·00	Nil	10·00	Nil	Nil
7. M.P. . .	P	32	Nil	84·37	15·62	15	93·33	Nil	Nil	6·67	Nil
	NP	69	31·88	68·11	Nil	58	94·83	Nil	1·72	3·45	Nil
8. Madras . .	P	1	Nil	Nil	100·00	Nil	..	..	..	..	..
	NP	1	Nil	100·00	Nil	1	Nil	Nil	Nil	100·00	Nil
9. Maharashtra .	P	11	Nil	90·90	9·09	10	100·00	Nil	Nil	Nil	Nil
	NP	97	6·18	40·20	53·60	26	100·00	Nil	Nil	Nil	Nil

TABLE No. 6.15—*contd.*

1	2	3	4	5	6	7	8	9	10	11	12
10. Mysore . .	P	Nil	..	..	..	..	..	..	..	..	..
	NP	38	Nil	97·36	2·63	25	68·00	Nil	4·00	28·00	Nil
11. Orissa . .	P	52	Nil	71·15	28·84	15	100·00	Nil	Nil	Nil	Nil
	NP	27	3·70	92·59	3·70	15	100·00	Nil	Nil	Nil	Nil
12. Punjab . .	P	Nil	..	..	..	..	..	..	..	..	..
	NP	2	Nil	100·00	Nil	1	100·00	Nil	Nil	Nil	Nil
13. Rajasthan . .	P	Nil	..	..	..	..	..	..	..	..	..
	NP	1	Nil	100·00	Nil	Nil	..	..	..	..	..
14. U.P. . .	P	13	Nil	100·00	Nil	1	100·00	Nil	Nil	Nil	Nil
	NP	127	0·78	94·48	4·72	95	84·21	3·16	11·58	1·05	Nil
15. West Bengal .	P	38	Nil	78·94	21·05	12	100·00	Nil	Nil	Nil	Nil
	NP	94	2·12	85·10	12·76	14	78·57	Nil	Nil	21·43	Nil
16. H.P. . .	P	N.R.									
	NP	41	Nil	97·56	2·43	11	72·73	Nil	27·27	Nil	Nil
All States . .	P	241	2·07	69·70	28·21	88	93·18	4·55	Nil	2·27	Nil
	NP	633	14·37	70·61	15·00	320	89·06	0·94	5·31	4·69	Nil

TABLE No. 6·15—*contd.*

Wheat (Irrigated)

1	2	3	4	5	6	7	8	9	10	11	12
1. Andhra . .	P	Nil	..	..	..	..	..	..	..	..	..
	NP	Nil	..	..	..	..	..	..	..	..	..
2. Assam . .	P	Nil	..	..	..	..	..	..	..	..	..
	NP	Nil	..	..	..	..	..	..	..	..	..
3. Bihar . .	P	71	1·40	98·59	Nil	70	100·00	Nil	Nil	Nil	Nil
	NP	1	Nil	100·00	Nil	Nil	..	..	..	..	..
4. Gujarat . .	P	3	Nil	33·33	66·66	1	100·00	Nil	Nil	Nil	Nil
	NP	70	34·28	65·71	Nil	2	100·00	Nil	Nil	Nil	Nil
5. J. & K. . .	P	Nil	..	..	..	..	..	..	..	..	..
	NP	N.R.	..	..	..	N.R.	..	..	..	..	..
6. Kerala . .	P	Nil	..	..	..	..	..	..	..	..	..
	NP	Nil	..	..	..	..	..	..	..	..	..
7. M.P. . .	P	Nil	..	..	..	..	..	..	..	..	..
	NP	99	46·46	49·49	4·04	86	98·84	Nil	Nil	1·16	Nil
8. Madras . .	P	1	Nil	100·00	Nil	1	100·00	Nil	Nil	Nil	Nil
	NP	Nil	..	..	..	..	..	..	..	..	..
9. Maharashtra .	P	Nil	..	..	..	..	..	..	..	..	..
	NP	2	Nil	100·00	Nil	Nil	..	..	..	..	..
10. Mysore . .	P	Nil	..	..	..	..	..	..	..	..	..
	NP	Nil	..	..	..	..	..	..	..	..	..
11. Orissa . .	P	Nil	..	..	..	..	..	..	..	..	..
	NP	Nil	..	..	..	..	..	..	..	..	..
12. Punjab . .	P	88	7·95	89·77	2·27	39	48·72	Nil	51·28	Nil	Nil
	NP	82	2·43	97·56	Nil	32	15·63	Nil	84·37	Nil	Nil
13. Rajasthan . .	P	51	Nil	100·00	Nil	Nil	..	..	..	..	..
	NP	146	Nil	99·31	0·68	65	33·85	Nil	13·79	Nil	Nil

TABLE No. 6.15—*contd.*

1	2	3	4	5	6	7	8	9	10	11	12
14. U.P.	P	91	Nil	100·00	Nil	29	86·21	Nil	13·79	Nil	Nil
	NP	176	Nil	100·00	Nil	141	73·76	1·42	23·40	1·42	Nil
15. W. Bengal	P	24	Nil	66·66	33·33	10	100·00	Nil	Nil	Nil	Nil
	NP	Nil	..	..	..	..	..	..	..	..	..
16. H.P.	P	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.
	NP	16	Nil	100·00	Nil	Nil	..	..	..	..	..
All States	P	329	2·43	93·92	3·64		84·00	Nil	16·00	Nil	Nil
	NP	592	12·16	86·99	0·84	326	66·87	0·61	25·15	7·36	..

TABLE No. 6.15—*contd.*

Sugarcane (Irrigated)

1	2	3	4	5	6	7	8	9	10	11	12
1. Andhra . .	P	12	83·33	8·33	8·33	11	72·73	Nil	Nil	9·09	18·18
	NP	16	Nil	100·00	Nil	10	10·00	10·00	Nil	80·00	Nil
2. Assam . .	P	Nil	..	..	..	..	..	..	..	..	..
	NP	Nil	..	..	..	..	..	..	..	..	..
3. Bihar . .	P	26	Nil	100·00	Nil	26	100·00	Nil	Nil	Nil	Nil
	NP	Nil	..	..	..	..	..	..	..	..	..
4. Gujarat . .	P	11	9·09	45·45	45·45	6	83·33	Nil	Nil	16·67	Nil
	NP	7	14·28	85·71	Nil	Nil	..	..	..	..	..
5. J. & K. . .	P	Nil	..	..	..	..	..	..	..	..	..
	NP	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.
6. Kerala . .	P	8	75·00	Nil	25·00	5	60·00	Nil	Nil	40·00	Nil
	NP	1	Nil	100·00	Nil	Nil	..	..	..	..	..
7. M.P. . .	P	Nil	..	..	..	..	..	..	..	..	..
	NP	3	Nil	Nil	100·00	1	Nil	Nil	Nil	100·00	Nil
8. Madras . .	P	Nil	..	..	..	..	..	..	..	..	..
	NP	Nil	..	..	..	..	..	..	..	..	..
9 Maharashtra .	P	Nil	..	..	..	..	..	..	..	..	..
	NP	1	Nil	100·00	Nil	Nil	..	..	..	..	..
10. Mysore . .	P	36	2·77	2·77	94·44	34	100·00	Nil	Nil	Nil	Nil
	NP	19	73·68	5·26	21·05	10	100·00	Nil	Nil	Nil	Nil
11. Orissa . .	P	3	33·33	33·33	33·3	2	100·00	Nil	Nil	Nil	Nil
	NP	Nil	..	..	..	..	..	..	..	..	..
12. Punjab . .	P	68	2·94	92·64	4·41	17	64·70	Nil	35·30	Nil	Nil
	NP	56	5·35	94·64	Nil	22	9·09	Nil	90·91	Nil	Nil
13. Rajasthan . .	P	Nil	..	..	..	..	..	..	..	..	..
	NP	38	Nil	100·00	Nil	26	3·84	Nil	23·08	73·08	Nil

TABLE No. 61.5—*contd.*

1	2	3	4	5	6	7	8	9	10	11	12
14. U.P. . .	P	55	Nil	100·00	Nil	22	90·91	Nil	9·09	Nil	Nil
	NP	167	Nil	100·00	Nil	80	65·00	2·50	22·50	10·00	Nil
15. West Bengal .	P	41	Nil	46·34	53·65	30	100·00	Nil	Nil	Nil	Nil
	NP	Nil	..	..	..	..	..	..	..	..	..
16. H.P. . .	P	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N-R.	N.R.	N.R.
	NP	1	Nil	100·00	Nil	Nil	..	..	..	..	..
All States . .	P	260	8·07	65·76	26·15	153	90·85	Nil	5·23	2·61	1·31
	NP	309	5·82	91·90	2·26	449	44·30	2·01	29·53	24·16	Nil

TABLE No.6·15—*contd.*

Groundnut (Un-irregated)

1	2	3	4	5	6	7	8	9	10	11	12
1. Andhra .	. P	Nil	..	..	..	..	..	..	..	..	..
	NP	25	4·00	68·00	28·00	1	Nil	Nil	Nil	100·00	Nil
2. Assam .	. P	Nil	..	..	..	..	..	..	..	..	..
	NP	Nil	..	..	..	..	..	..	..	..	..
3. Bihar .	. P	Nil	..	..	..	..	..	..	..	..	..
	NP	Nil	..	..	..	..	..	..	..	..	..
4. Gujarat .	. P	37	8·10	64·86	27·02	4	75·00	Nil	Nil	25·00	Nil
	NP	90	14·44	85·55	Nil	1	100·00	Nil	Nil	Nil	Nil
5. J. & K. .	. P	Nil	..	..	..	..	..	..	..	..	..
	NP	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.
6. Kerala .	. P	Nil	..	..	..	..	..	..	..	..	..
	NP	Nil	..	..	..	..	..	..	..	..	..
7. M.P. .	. P	Nil	..	..	..	..	..	..	..	..	..
	NP	38	2·63	97·36	Nil	15	86·67	Nil	Nil	13·33	Nil
8. Madras .	. P	Nil	..	..	..	..	..	..	..	..	..
	NP	7	Nil	71·42	28·57	2	Nil	50·00	50·00	Nil	Nil
9. Maharashtra	. P	Nil	..	..	..	..	..	..	..	..	..
	NP	25	8·00	88·00	4·00	2	50·00	Nil	Nil	50·00	Nil
10. Mysore .	. P	Nil	..	..	..	..	..	..	..	..	..
	NP	5	Nil	80·00	20·00	Nil	..	..	..	..	..
11. Orissa .	. P	3	Nil	100·00	Nil	1	100·00	Nil	Nil	Nil	Nil
	NP	Nil	..	..	..	..	..	..	..	..	..
12. Punjab .	. P	24	75·00	Nil	25·00	19	84·21	Nil	15·79	Nil	Nil
	NP	Nil	..	..	..	..	..	..	..	..	..
13. Rajasthan .	P	Nil	..	..	..	..	..	..	..	..	..
	NP	Nil	..	..	..	..	..	..	..	..	..

TABLE No. 6.15—*contd.*

1	2	3	4	5	6	7	8	9	10	11	12
14. U.P.	P	Nil	..	..	..	..	..	..	..	..	..
	NP	1	Nil	100·00	Nil	1	100·00	Nil	Nil	Nil	Nil
15. W. Bengal	P	Nil	..	..	..	..	..	..	..	..	..
	NP	Nil	..	..	..	..	..	..	..	..	..
16. H. Pradesh	P	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.	N.R.
	NP	Nil	..	..	..	..	..	..	..	..	..
All States	P	64	32·81	42·18	25·00	24	83·33	Nil	12·50	4·17	Nil
	NP	191	8·90	85·34	5·75	22	72·72	4·55	4·55	18·18	Nil

TABLE No. 6.16

Percentage distribution of respondents according to their preference for various types of fertilisers with reasons thereon for the important crops

Crops	Type of fertilisers	No. of relevant respondents	Package				
			Reasons relating crop growth	Relating superiority of fertilisers	Relating crop yield	Relating convictions	Soil, lack of Irrigation and other natural factors
1	2	3	4	5	6	7	8
Paddy (Irrigated)	A.S.	476	71·2	Nil	43·2	Nil	Nil
	A.S.N.	3	66·6	Nil	100·00	Nil	Nil
	CAN	35	34·2	17·1	42·8	14·2	11·4
	Urea	70	80·0	1·4	41·4	2·8	Nil
	Other 'N' Fertilisers	1	100·0	Nil	100·0	Nil	Nil
Paddy (Un-irrigated)	A.S.	61	62·2	Nil	49·1	Nil	Nil
	A.S.N.	4	Nil	Nil	100·0	Nil	Nil
	C.A.N.	Nil	..	..	..	..	..
	Urea	2	100·0	Nil	100·0	Nil	Nil
	Other 'N' Fertilisers	Nil	..	..	..	..	..
Wheat (Irrigated)	A.S.	100	78·0	Nil	19·0	Nil	Nil
	A.S.N.	Nil	..	..	..	..	..
	CAN	18	16·16	Nil	11·1	33·3	16·6
	Urea	Nil	..	..	..	..	..
	Other 'N' Fertiliser	Nil	..	..	..	..	..
Sugarcane (Irrigated)	A.S.	146	75·3	Nil	23·2	0·6	Nil
	A.S.N.	Nil	..	..	..	..	..
	CAN	5	20·0	Nil	20·0	60·0	20·0
	Urea	3	66·6	Nil	Nil	Nil	Nil
	Other 'N' Fertiliser	1	100·00	Nil	100·0	Nil	Nil
Groundnut (Un-irrigated)	A.S.	18	66·6	Nil	5·5	Nil	Nil
	A.S.N.	Nil	..	..	..	..	..
	CAN	3	33·3	Nil	33·3	Nil	33·3
	Urea	Nil	..	..	..	..	..
	Other 'N' Fertiliser	Nil	..	..	..	..	..

Table No. 6.16—*contd.*

Percentage distribution of respondents according to their preferences for various types of fertilisers with reasons thereon for the important crops

Crops	Type of fertilisers	No. of relevant respondents	Non-Package: Reasons relating crop growth	Non-Package: Relating superiority of fertilisers	Non-Package: Relating crop yield	Non-Package: Relating convictions	Non-Package: Soil, lack of Irrigation and factors
1	2	3	9	10	11	12	13
Paddy (Irrigated)	A.S.	298	61·0	0·3	46·9	1·0	1·0
	A.S.N.	1	Nil	Nil	100·00	Nil	Nil
	CAN	14	28·5	Nil	57·1	Nil	14·2
	Urea	84	55·9	Nil	34·5	1·1	9·5
	Other 'N' Fertiliser	Nil	..	..	..	..	..
Paddy (Un-irrigated)	A.S.	136	50·0	Nil	49·2	1·4	0·7
	A.S.N.	3	100·00	Nil	Nil	Nil	Nil
	CAN	6	16·6	Nil	83·3	Nil	16·6
	Urea	8	37·5	Nil	62·5	Nil	Nil
	Other 'N' Fertliser	Nil	..	..	..	..	..
Wheat (Irrigated)	A.S.	97	34·0	Nil	49·4	1·0	1·0
	A.S.N.	1	100·00	Nil	Nil	Nil	Nil
	CAN	43	13·9	Nil	46·5	2·3	30·2
	Urea	5	20·0	Nil	40·0	40·0	40·0
	Other 'N' Fertiliser	Nil	..	..	..	..	..
Sugarcane (Irrigated)	A.S.	49	57·1	4·0	38·7	Nil	Nil
	A.S.N.	3	33·3	Nil	66·6	Nil	Nil
	CAN	30	13·3	Nil	53·3	Nil	30·0
	Urea	18	55·5	Nil	16·6	5·5	33.3
	Other 'N' Fertiliser	Nil	..	..	..	..	..
Groundnut (Un-irrigated)	A.S.	7	28·5	Nil	Nil	Nil	14·2
	A.S.N.	Nil	..	..	..	..	..
	CAN	Nil	..	..	..	..	..
	Urea	2	50·0	Nil	Nil	Nil	Nil
	Other 'N' Fertiliser	Nil	..	..	..	..	..

TABLE No. 6.17

Percentage distribution of respondents according to reasons for partial coverage of area with fertilisers by category of cultivators and crops

Paddy (Irrigated)

Year	Category of respondents	Package				
		No. of respondents having part of the area not fertilised	Proportion of respondents giving reasons for not using fertilisers on the part of the area			
			Difficulties of supply (% to col. 3)	Difficulties of credit (% to col. 3)	Soil, lack of irrigation and other natural factors (% to col. 3)	Reasons relating conviction (% to col. 3)
1	2	3	4	5	6	7
1962-63	Owners	98	4·1	35·7	27·5	31·6
	Tenants	23	Nil	13·0	8·7	73·9
	Others	5	Nil	20·0	Nil	40·0
	TOTAL	126	3·2	30·9	23·1	30·7
1961-62	Owners	81	4·9	32·1	21·0	33·3
	Tenants	21	Nil	14·3	19·0	71·4
	Others	2	Nil	Nil	Nil	100·0
	TOTAL	104	3·8	27·9	20·2	42·3
1960-61	Owners	90	7·8	32·2	21·1	27·8
	Tenants	23	Nil	17·4	21·7	60·9
	Others	3	Nil	Nil	Nil	66·7
	TOTAL	116	6·0	28·4	20·7	35·3
1959-60	Owners	94	8·5	36·2	19·2	26·6
	Tenants	24	4·2	12·5	20·8	54·2
	Others	3	Nil	Nil	Nil	66.7
	TOTAL	121	7·4	30·6	19·0	33·1

TABLE No. 6·17—*contd.*

Paddy (Irrigated)

Year	Category of respondents	Non-Package				
		No. of respondents with part of the area not fertilised	Proportion of respondents giving reasons for not using fertilisers on the part of the area			
			Difficulties of supply (% to col. 8)	Difficulties of credit (% to col. 8)	Soil, lack of irrigation and other natural factors (% to col. 8)	Reasons relating conviction (% to col. 8)
1	2	8	9	10	11	12
1962-63	Owners	85	3·5	42·4	27·1	11·8
	Tenants	11	Nil	45·5	9·1	27·3
	Others	12	16·7	25·0	Nil	33·3
	TOTAL	108	4·6	40·7	22·2	15·7
1961-62	Owners	100	3·0	35·0	24·0	12·0
	Tenants	10	Nil	50·0	10·0	30·0
	Others	13	7·7	15·4	7·7	23·1
	TOTAL	123	3·3	34·1	21·1	14·6
1960-61	Owners	98	2·0	28·6	25·5	12·2
	Tenants	10	Nil	50·0	10·0	40·0
	Others	12	8·3	33·3	8·3	25·0
	TOTAL	120	2·5	30·8	22·5	15·8
1959-60	Owners	97	2·1	27·8	26·8	13·4
	Tenants	11	Nil	45·5	9·1	36.4
	Others	11	9·1	18·2	Nil	27.3
	TOTAL	119	2·5	28·6	22·7	16·8

TABLE No. 6·17—*contd.*

Paddy (Un-irrigated)

Package

1	2	3	4	5	6	7
1962-63	Owners	92	1·1	19·6	16·3	8·7
	Tenants	34	Nil	11·8	2·9	5·9
	Others	4	Nil	25·0	Nil	Nil
	TOTAL	130	0·8	17·7	12·3	7·7
1961-62	Owners	94	Nil	21·3	20·2	7·4
	Tenants	31	Nil	9·7	3·2	6·5
	Others	3	Nil	33·3	Nil	Nil
	TOTAL	128	Nil	18·8	15·6	7·0
1960-61	Owners	90	Nil	16·7	20·0	7·8
	Tenants	29	Nil	6·9	3·4	6·9
	Others	3	Nil	33·3	Nil	Nil
	TOTAL	122	Nil	14·8	15·6	7·4
1959-60	Owners	92	Nil	15·2	18·5	7·6
	Tenants	29	Nil	Nil	3·4	6·9
	Others	3	Nil	33·3	Nil	Nil
	TOTAL	124	Nil	12·1	14·5	7·3

TABLE NO. 6.17—*contd.*

Paddy (Un-irrigated)

Non-Package

1	2	8	9	10	11	12
1962-63	Owners	360	2·8	47·5	20·6	10·3
	Tenants	27	Nil	7·4	7·4	7·4
	Others	22	Nil	36·4	13·6	13·6
	TOTAL	409	2·4	44·3	19·3	10·3
1961-62	Owners	363	2·8	48·2	20·4	10·5
	Tenants	25	Nil	12·0	8·0	4·0
	Others	20	Nil	40·0	10·0	10·0
	TOTAL	408	2·5	45·6	19·1	10·0
1960-61	Owners	364	2·2	48·6	19·5	9·9
	Tenants	28	Nil	32·1	7·1	Nil
	Others	21	Nil	38·1	14·3	14·3
	TOTAL	413	1·8	47·0	18·4	9·4
1959-60	Owners	366	1·9	47·3	18·0	9·8
	Tenants	27	Nil	29·6	7·4	Nil
	Others	20	Nil	32·0	10·0	10·0
	TOTAL	413	1·7	45·8	16·9	9·2

TABLE No. 6·17—*contd.*

Wheat (Irrigated)

Package

1	2	3	4	5	6	7
1962-63	Owners	91	2·2	58·2	9·9	23·1
	Tenants	14	Nil	78·0	Nil	14·3
	Others	2	Nil	50·0	50·0	Nil
	TOTAL	107	1·9	60·7	9·3	21·5
1961-62	Owners	106	3·8	52·8	10·4	24·5
	Tenants	11	Nil	81·8	Nil	1·8
	Others	3	Nil	66·7	33·3	Nil
	TOTAL	120	3·3	55·8	10·0	23·3
1960-61	Owners	120	2·5	50·0	8·3	22·5
	Tenants	12	Nil	50·0	Nil	33·3
	Others	4	Nil	75·0	25·0	Nil
	TOTAL	136	2·2	50·7	8·1	22·8
1959-60	Owners	113	1·8	43·4	10·6	24·8
	Tenants	14	Nil	50·0	Nil	21·4
	Others	3	Nil	100·0	Nil	Nil
	TOTAL	130	1·5	45·4	9·2	23·8

TABLE No. 6·17—*contd.*

Wheat (Irrigated)

Non-Package

1	2	8	9	10	11	12
1962-63	Owners	293	3·8	35·2	41·3	26·3
	Tenants	15	6·7	40·0	58·3	20·0
	Others	27	Nil	25·9	22·2	25·9
	TOTAL . .	335	3·6	34·6	40·3	26·0
1961-62	Owners	297	3·4	36·4	41·4	21·9
	Tenants	16	6·3	37·5	56·3	18·8
	Others	23	Nil	30·4	13·0	30·4
	TOTAL . .	336	3·3	36·0	40·2	22·3
1960-61	Owners	292	3·4	33·9	38·4	22·6
	Tenants	16	6·3	37·5	50·0	18·8
	Others	24	Nil	25·0	8·3	37·5
	TOTAL . .	332	3·3	33·4	36·7	23·5
1959-60	Owners	306	3·6	31·7	30·4	23·2
	Tenants	13	7·7	38·5	38·5	23·1
	Others	22	Nil	18·2	9·1	36·4
	TOTAL . .	341	3·5	31·1	29·3	24·0

TABLE NO. 6·17—*contd.*

Sugarcane (Irrigated)

Package

1	2	3	4	5	6	7
1962-63	Owners	14	Nil	57·1	Nil	28·6
	Tenants	2	Nil	100·0	Nil	Nil
	Others	Nil	..	..	..	..
	TOTAL . .	16	Nil	62·5	Nil	25·0
1961-62	Owners	8	Nil	50·0	Nil	12·5
	Tenants	3	Nil	66·7	Nil	Nil
	Others	Nil	Nil	Nil	Nil	Nil
	TOTAL . .	11	Nil	54·5	Nil	9·1
1960-61	Owners	11	Nil	63·6	Nil	9·1
	Tenants	2	Nil	100·0	Nil	Nil
	Others	Nil	..	..	..	..
	TOTAL . .	13	Nil	69·2	Nil	9·1
1959-60	Owners	11	Nil	63·6	9·1	18·2
	Tenants	Nil	..	..	..	..
	Others	Nil	..	..	..	..
	TOTAL . .	11	Nil	63·6	9·1	18·2

TABLE No. 6·17—*contd.*

Sugarcane (Irrigated)

Non-Package

1	2	8	9	10	11	12
1962-63	Owners	21	Nil	19·0	19·0	28·6
	Tenants	1	Nil	Nil	100·0	Nil
	Others	Nil	..	..	..	..
	TOTAL	22	Nil	18·2	22·7	27·3
1961-62	Owners	30	0·3	16·7	23·3	33·3
	Tenants	1	Nil	100·0	Nil	Nil
	Others	1	Nil	Nil	100·0	Nil
	TOTAL	32	0·3	18·8	25·0	31·3
1960-61	Owners	20	Nil	25·0	10·0	20·0
	Tenants	2	Nil	50·0	Nil	Nil
	Others	Nil	..	..	..	..
	TOTAL	22	Nil	22·7	9·1	18·2
1959-60	Owners	23	Nil	8·7	13·0	17·4
	Tenants	2	Nil	Nil	50·0	Nil
	Others	1	Nil	Nil	100·0	Nil
	TOTAL	26	Nil	7·7	19·2	15·4

TABLE No. 6·17—*contd.*

Groundnut (Un-irrigated)

Package

1	2	3	4	5	6	7
1962-63	Owners	18	5·6	11·1	22·2	Nil
	Tenants	Nil	..	..	..	..
	Others	Nil	..	..	..	..
	TOTAL	18	5·6	11·1	22·2	Nil
1961-62	Owners	11	Nil	Nil	9·1	Nil
	Tenants	Nil	..	..	..	..
	Others	Nil	..	..	..	..
	TOTAL	11	Nil	Nil	9·1	Nil
1960-61	Owners	13	Nil	Nil	Nil	Nil
	Tenants	1	Nil	Nil	Nil	Nil
	Others	Nil	..	..	..	..
	TOTAL	14	Nil	Nil	Nil	Nil
1959-60	Owners	14	Nil	Nil	Nil	Nil
	Tenants	1	Nil	Nil	Nil	Nil
	Others	Nil	..	..	..	..
	TOTAL	15	Nil	Nil	Nil	Nil

TABLE No. 6·17—*contd.*

Groundnut (Un-irrigated)

Non-Package

1	2	8	9	10	11	12
1962-63	Owners	96	3·1	28·1	28·1	18·6
	Tenants	1	Nil	Nil	Nil	100·0
	Others	7	Nil	28·6	14·3	Nil
	TOTAL . .	104	2·9	27·9	26·9	18·3
1961-62	Owners	87	Nil	34·5	29·9	12·6
	Tenants	Nil	. .	. .	. .	. .
	Others	7	Nil	14·3	Nil	Nil
	TOTAL . .	94	Nil	33·0	27·7	11·7
1960-61	Owners	89	Nil	33·7	27·0	15·7
	Tenants	Nil	. .	. .	. .	. .
	Others	7	Nil	28·6	14·3	Nil
	TOTAL . .	96	Nil	33·3	26·0	14·6
1959-60	Owners	87	1·1	28·7	26·4	10·3
	Tenants	Nil	. .	. .	. .	. .
	Others	6	Nil	16·7	16·7	Nil
	TOTAL . .	93	1·1	28·0	25·8	8·3

TABLE No. 7·1

Particulars of targets for production and extent of achievements for compost during 1961-62 *and* 1962-63

State	District P for package	Targets and extent of achievement during			
		1961-62		1962-63	
		Targets (in M.T.)	Extent of achievement	Target M.T	Extent of achievement
1	2	3	4	5	6
1. Andhra Pradesh	W. Godavari (P)	932,408	100·0	1,018,719	104·3
	Chittoor	1,340,042	85·8	1,431,360	94·0
	Karimnagar	..	..	..	..
2. Assam	Cachar (P)	64,059	109·0	54,360	96·4
	Goalpara	71,500	38·5	54,150	191·8
3. Bihar	Shahabad (P)	42,600	51·2	25,820	93·1
	Muzafferpur	100,000	102·9	147,000	130·2
4. Gujarat	Surat (P)	12,200	211·9	15,200	139·3
	Bhavnagar	13,000	88·1	16,500	103·3
5. Jammu & Kashmir	Anantnag (P)	..	..	..	..
6. Kerala	Alleppey (P)	170,000	104·9	180,000	15·2
	Trichur	21,000	49·9	..	..
7. Madhya Pradesh	Raipur (P)	126,000	86·6	153,300	55·8
	Balaghat	10,500	200·4	..	..
	Chattarpur	..	..	..	..
	Mandsaur	7,000	268·6	8,000	624·9
8. Madras	Thanjavur (P)	593,500	..	..	..
	S. Arcot	..	..	..	..
9. Maharashtra	Bhandara (P)	..	..	..	..
	Kolaba	20,000	76·7	25,000	27·8
	Yeotmal	25,657	92·1	34,960	65·4
10. Mysore	Mandya (P)	137,210	71·3	137,210	121·2
	Raichur	174,828	14·6	206,346	28·4
	S. Kanara	74,000	42·1	80,000	37·7

TABLE NO. 7·1—*contd.*

1	2	3	4	5	6
11. Orissa.	Sambalpur (P)	1,259,000	30·8	1,713,000	27·6
	Cuttack	1,250,000	42·1	1,616,000	40·6
12. Punjab	Ludhiana (P)	296,000	161·5	376,000	128·7
	Hissar	..	..	..	..
13. Rajasthan	Pali (P)	..	..	..	..
	Chittorgarh	16,000	128·1	12,000	112·2
	Ganganagar	10,160	465·8	..	..
14. Uttar Pradesh	Aligarh (P)	338,640	35·5	554,880	28·5
	Azamgarh	440,000	81·1	565,000	74·0
	Jhansi	215,000	28·2	289,200	37·5
	Muzaffernagar	307,524	71·6	443,389	69·9
15. West Bengal	Burdwan (P)	36,000	83·8	..	..
	Cooch-Behar	120,000	45·0	120,000	50·0
16. Himachal Pradesh	Sirmur	30,000	92·0	50,000	125·5
ALL INDIA	Package	3,414,117	67·1	4,228,489	60·4
	Non-package	4,246,211	67·7	5,098,905	67·7
	TOTAL	7,660,308	65·8	9,327,394	64·4

TABLE No. 7·2

Percentage of respondents preparing compost in the year 1962-63, *State-wise*

State	Type	Total No. of respon-dents	No. and proportion of respondents preparing compost, category-wise			
			Owners	Tenants	Others	Total
1	2	3	4	5	6	7
1. Andhra Pradesh	Package	100	25 (26·88)	3 (42·85)	..	28 (28·00)
	Non-package	200	51 (32·69)	1 (6·66)	8 (27·58)	60 (30·00)
2. Assam	Package	100	21 (30·88)	10 (31·25)	...	31 (31·00)
	Non-package	100	16 (19·51)	1 (5·88)		17 (17·00)
3. Bihar	Package	100	..	..	..	..
	Non-package	100	27 (31·03)	5 (45·45)	...	32 (32·00)
4. Gujarat	Package	100	...	..	...	..
	Non-package	100	9 (9·27)	..	...	9 (9·00)
5. Jammu & Kashmir . . .	Package	50	11 (22·91)	..	..	11 (22·00)
6. Kerala	Package	100	10 (15·87)	1 (14·28)	5 (16·66)	16 (16·00)
	Non-package	100	8 (17·39)	2 (10·52)	2 (5·71)	12 (12·00)
7. Madhya Pradesh	Package	100	97 (97·97)	1 (100·00)	..	98 (98·00)
	Non-package	300	150 (53·57)	..	12 (70·58)	162 (54·00)
8. Madras	Package	100	1 (1·26)	1 (4·76)	..	2 (2·00)
	Non-package	100	7 (10·44)	3 (13·63)	..	10 (10·00)
9. Maharashtra	Package	100	96 (96·00)	..	..	96 (96·00)
	Non-package	200	35 (18·91)	2 (100·00)	2 (15·38)	39 (19·50)
10. Mysore	Package	100	23 (25·00)	2 (100·00)	3 (50·00)	28 (28·00)
	Non-package	200	4 (2·75)	3 (6·12)	..	7 (3·50)
11. Orissa	Package	100	1 (1·88)	..	..	1 (1·00)
	n-package	100	11 (12·79)	3 (37·50)	3 (50·00)	17 (17·00)
12. Punjab	Package	100	78 (92·85)	15 (93·75)	..	93 (93·00)
	Non-package	100	48 (56·47)	9 (64·28)	..	57 (57·00)
13. Rajasthan . .	Package	100	39 (58·20)	..	6 (18·75)	45 (45·00)
	Non-package	199	103 (64·37)	..	19 (48·71)	122 (61·33)

TABLE No. 7·2—*contd.*

1	2	3	4	5	6	7
14. Uttar Pradesh	Package	100	11 (12·79)	6 (60·00)	..	17 (17·00)
	Non-package	300	143 (52·38)	7 (77·77)	7 (38·88)	157 (52·33)
15. West Bengal	Package	100	1 (1·72)	..	..	1 (1·00)
	Non-package	100	25 (31·64)	1 (8·33)	1 (11·11)	27 (27·00)
16. Himachal Pradesh . . .	Non-package	100	45 (63·38)	2 (40·00)	15 (62·50)	62 (62·00)
ALL INDIA	Package	1,450	414 (35·05)	39 (28·88)	14 (10·44)	467 (32·20)
	Non-package	2,299	682 (35·93)	39 (20·85)	69 (32·39)	790 (34·36)
	TOTAL	3,749	1,096 (35·59)	78 (24·22)	83 (23·91)	1,257 (33·52)

TABLE NO. 7·3

Percentage distribution of respondents according to the pattern of utilisation of cow dung for various purposes, state-wise

State	Type of District	Proportion of respondents using various percentage of cow dung for							
		Compost				F.Y.M.			
		25% or less	26—50	51—75	76—100	25% or less	26—50	51—75	75—100
1	2	3	4	5	6	7	8	9	10
1. Andhra Pradesh . .	Package	2·0	14·00	13·00	5·00	12·00	7·00	9·00	41·00
	Non-package	0·50	..	5·50	21·00	4·00	..	5·50	62·00
2. Assam	Package	..	..	2·00	29·00	1·00	1·00	..	49·00
	Non-package	..	1·00	3·00	12·00	8·00	2·00	8·00	73·00
3. Bihar	Package	1·00	..	..	..	35·00	64·00	..	..
	Non-package	2·00	..	3·00	21·00	41·00	6·00	4·00	23·00
4. Gujarat	Package	1·00	..	..	..	..	..	3·00	85·00
	Non-package	..	..	..	6·00	..	7·00	15·00	70·00
5. Jammu & Kashmir . .	Package	6·00	8·00	6·00	..	2·00	40·00	40·00	2·00
6. Kerala	Package	7·00	5·00	..	1·00	4·00	13·00	7·00	52·00
	Non-package	5·00	2·00	1·00	4·00	5·00	4·00	8·00	65·00
7. Madhya Pradesh . .	Package	1·00	91·00	1·00	..	..	..	..	..
	Non-package	1·66	3·66	12·33	35·00	14·00	10·00	17·33	26·00
8. Madras	Package	0·00	1·00	..	1·00	..	..	1·00	95·00
	Non-package	..	2·00	1·00	6·00	..	4·00	11·00	77·00
9. Maharashtra	Package	1·00	..	3·00	91·00	..	..	..	..
	Non-package	1·50	2·00	3·50	13·00	19·00	1·50	2·50	21·00
10. Mysore	Package	1·00	..	..	27·00	..	..	1·00	71·00
	Non-package	1·50	1·00	..	1·00	..	3·50	23·50	67·50
11. Orissa	Package	1·00	..	..	..	1·00	7·00	28·00	60 00
	Non-package	3·00	6·00	4·00	4·00	24·00	23·00	21·00	9·00
12. Punjab	Package	..	37·00	26·00	30·00	1·00	1·00	5·00	..
	Non-package	18·00	37·00	1·00	..	7·00	8·00	1·00	..

TABLE NO. 7·3—*contd.*

1	2	3	4	5	6	7	8	9	10
13. Rajasthan . . .	**Package**	1·00	3·00	2·00	39·00	1·00	4·00	3·00	32·00
	Non-package	..	1·50	10·05	46·73	0·50	5·02	3·01	17·08
14. Uttar Pradesh . . .	**Package**	..	..	9·00	3·00	2·00	28·00	46·00	12·00
	Non-package	0·66	7·00	27·33	17·00	0·33	15·33	20·00	11·66
15. West Bengal . . .	Package	1·00	..	..	..	6·00	17·00	33·00	43·00
	Non-package	..	1·00	2·00	24·00	..	4·00	10·00	53·00
16. Himachal Pradesh . .	Non-package	2·00	11·00	16·00	32·00	10·00	16·00	8·00	34·00
ALL INDIA . . .	Package	1·31	10·68	4·06	15·58	4·41	11·17	10·75	37·31
	Non-package	1·91	4·39	8·81	18·61	8·05	7·39	11·61	37·01
	TOTAL	1·70	7·09	6·59	17·17	6·64	8·59	11·28	37·12

TABLE No. 7·3—*contd.*

State	Type of District	Proportion of respondents using various percentage of cowdung for							
		Fuel				Other purposes			
		25% or less	26—50	51—75	75—100	25% or less	26—50	51—75	75—100
1	2	11	12	13	14	15	16	17	18
1. Andhra Pradesh . .	Package	64·00	21·00	1·00	1·00	2·00	..	..	..
	Non-package	54·00	1·50	..	..	37·00	0·50	..	..
2. Assam	Package	1·00	..	..	..	1·00	..	..	..
	Non-package	14·00	2·00	..	..	67·00	2·00	..	..
3. Bihar	Package	3·00	..	64·00	30·00	2·00	..	..	1·00
	Non-package	39·00	5·00	21·00	18·00	58·00	7·00	..	..
4. Gujarat	Package	59·00	1·00	..	1·00	52·00	..	..	..
	Non-package	70·00	14·00	1·00	..	22·00	..	..	..
5. Jammu & Kashmir . .	Package	12·00	52·00	28·00	..	..	..	..	..
6. Kerala	Package	..	..	..	..	1·00	5·00	5·00	3·00
	Non-package	9·00	3·00	8·00	..	30·00	4·00	..	..
7. Madhya Pradesh . .	Package	1·00	1·00	91·00	..	..	..	..	..
	Non-package	35·33	18·00	..	..	25·00	..	..	..
8. Madras	Package	1·00	..	..	..	..	..	..	..
	Non-package	12·00	12·00	..	..	..	..	..	..
9. Maharashtra . . .	Package	15·00	7·00	..	..	..	..	..	..
	Non-package	12·00	5·00	1·00	..	2·00	..	4·00	49·50
10. Mysore	Package	..	..	..	..	..	..	..	..
	Non-package	65·00	21·50	1·50	..	25·00	24·00	..	..
11. Orissa	Package	17·00	22·00	2·00	60·00	1·00	..	..	..
	Non-package	19·00	35·00	26·00	16·00	14·00	..	..	..
12. Punjab	Package	44·00	48·00	6·00	1·00	1·00	..	..	..
	Non-package	3·00	2·00	59·00	34·00	87·00	2·00	..	..
13. Rajasthan	Package	7·00	7·00	..	9·00	82·00	1·00	..	..
	Non-package	62·31	10·55	1·50	10·05	28·64	2·01	1·50	..

TABLE No. 7·3—*contd.*

1	2	11	12	13	14	15	16	17	18
14. Uttar Pradesh . . .	Package	30·00	67·00	1·00	..	..	..	..	..
	Non-package	55·66	35·00	2·66	..	0·33	..	..	..
15. West Bengal . . .	Package	40·00	29·00	8·00	1·00	9·00	..	..	..
	Non-package	22·00	9·00	1·00	3·00	17·00	..	..	..
16. Himachal Pradesh . .	Non-package	95·00	1·00	..	..	96·00	1·00	1·00	...
ALL INDIA . . .	Package	19·86	15·79	12·89	2·96	10·41	0·41	3·34	0·27
	Non-package	40·97	13·87	5·39	3·95	28·36	3·00	0·52	3·95
	TOTAL	32·80	14·60	8·28	3·60	21·40	2·00	0·45	2·55

TABLE No. 7.4

Particulars of targets fixed for green manuring and extent of achievements during 1961-62 *and* 1962-63

State	District (P for package)	Targets and extent of achievement during			
		1961-62		1962-63	
		Targets (in M. tons)	Extent of achievement	Targets (in M. tons)	Extent of achievement
1	2	3	4	5	6
1. Andhra Pradesh	W. Godavari (P)	13,759	137·8	13,759	158·7
	Chittoor	..	..	..	..
	Karimnagar	..	..	..	..
2. Assam	Cachar (P)	..	..	..	..
	Goalpara	..	..	..	..
3. Bihar	Shahabad (P)	12,516	58·3	5,120	103·6
	Muzafferpur	41,840	80·6	40,000	91·9
4. Gujarat	Surat (P)	20,000	95·8	30,000	102·7
	Bhavnagar	400	10·0	600	2·5
5. Jammu & Kashmir	Anantnag (P)	..	..	..	..
6. Kerala	Alleppey (P)	..	..	..	..
	Trichur	..	..	..	..
7. Madhya Pradesh	Raipur (P)	5,513	187·9	26,785	60·4
	Balaghat	..	..	..	..
	Chhatarpur	..	..	..	..
	Mandsaur	1,600	558·1	3,200	60·9
8. Madras	Thanjvur (P)	900	85·9	800	104·2
	S. Arcot	..	..	..	..
9. Maharashtra	Bhandara (P)	..	..	..	..
	Kolaba	..	..	..	..
	Yeotmal	..	..	..	..
10. Mysore	Mandya (P)	..	..	..	..
	Raichur	2,025	80·4	2,430	107·1
	S. Kanara	..	..	..	..

TABLE No. 7·4—*contd.*

1	2	3	4	5	6
11. Orissa.	Sambalpur (P)	..	..	..	..
	Cuttack	..	..	189,200	76·6
12. Punjab	Ludhiana (P)	14,164	316·7	24,463	198·5
	Hissar	..	..	..	..
13. Rajasthan	Pali (P)	809	66·7	809	8·2
	Chittorgarh	2,400	33·8	3,520	38·5
	Ganganagar	3,399	171·1	..	..
14. Uttar Pradesh	Aligarh (P)	18,628	342·3	18,974	35·2
	Azamgarh	16,187	64·5	24,281	63·8
	Jhansi	2,865	34·3	4,457	55·5
	Muzaffernagar	15,750	105·0	19,698	93·5
15. West Bengal	Burdwan (P)	..	..	..	
	Cooch Behar	..	..	..	..
16. Himachal Pradesh	Sirmur	..	..	..	..
ALL INDIA	Package	86,268	125·5	120,710	108·7
	Non-package	86,486	82·1	287,386	78·0
	TOTAL	172,754	103·8	408,096	87·1

PROGRAMME EVALUATION ORGANISATION

(Planning Commission)

List of Publications

1.* Group Dynamics in a North Indian Village. (1954).
2.* Evaluation Report on First Years' Working of Community Projects (May 1954).
3.* Community Projects—First Reactions. (August 1954).
4. Training of Village Leaders in Bhopal. (September 1954).
5. Cotton Extension in P.E.P.S.U.—A case study. (1955).
6.* Evaluation Report on Second Years' Working of Community Projects (Vols. I & II). (April 1955).
7. Evaluation Report on Second Years' Working of Community Projects (Summary) (April 1955).
8.* Training of Village Artisans in Bihar (May 1955).
9. Leadership and Groups in a South Indian Village (June 1955).
10. Evaluation Report on Working of Community Projects and N.E.S. Block (April 1956).
11. Evaluation Report on Working of Community Projects and N.E.S. Blocks (April, 1956 (Summary).
12.* Bench Mark Survey Report—Batala (Punjab) (February, 1956).
13.* Bench Mark Survey Report—Bhadrak (Orissa) (1956).
14.* Three Years of Community Projects (August 1956).
15. Study of village Artisans (August 1956).
16.* Bench Mark Survey Report—Kolhapur (Bombay) (July 1956).
17.* Bench Mark Survey Report—Morsi (Madhya Pradesh) (Nov. 1956).
18.* Studies in Co-operative Farming (December 1957).
19. Fourth Evaluation Report on Working of Community Projects and N.E.S. Blocks—Vol. I : (includes studies on, 1. Achievements and Problems of the Community Development Programme, 2. Some Aspects of the Community Development Programme) (April 1957).
20.* Fourth Evaluation Report on—Working of Community Projects and N.E.S. Blocks—Vol. II : includes studies on, 1. Some Aspects of Social Change, 2. Enquiry into coverage by Project Programme. (May 1957).
21. Bench Mark Survey Reports—Malavalli (Mysore) and Chalakudy (Kerala), (July, 1957).
22. Bench Mark Survey Reports—Banswada (Andhra), Samalkot (Andhra) and Erode (Madras) Blocks, (July 1957).
23.* Bench Mark Survey Reports—Pusa (Bihar), Mohd. Bazar (West Bengal) and Arunachal (Assam) Blocks (July 1957).
24.* Bench Mark Survey Reports—Pounta (Himachal Pradesh). Bhadson (Punjab) and Bhathat (Uttar Pradesh), Blocks (Oct. 1957).
25.* Bench Mark Survey Reports—Manavadar (Bombay), Nowgong (Madhya Pradesh) and Rajpur (Madhya Pradesh) Block (Oct. 1957).
26. Fifth Evaluation Report on Working of Community Development and N.E.S. Blocks : includes studies on 1. Current Evaluation Study, 2. Acceptance of Practices, 3. Study of Panchayats, 4. Block Records (May 1958).
27. Fifth Evaluation Report on Working of Community Development and N.E.S. Blocks Summary and Conclusions, (May, 1958).
28. A study of Panchayats, (May, 1958).
29. Evaluation Report on the Working of the Welfare Extension Projects of the Central Social Welfare Board, (April, 1959).

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*Out of stock.

30. Evaluation Report on the Working of the Large and Small Size Co-operative Societies, (April, 1959).
31. The Sixth Evaluation Report on Working of Community Development and N.E.S. [illegible] : *includes studies on 1. Planning Process,* 2. Cottage Industries, 3. Social Education, 4. Study of Cooperatives—Large and Small, (June, 1959).
32. The Seventh Evaluation Report on C.D. and Some Allied Fields (1960): includes studies on 1. Current Evaluation Study of 18 selected blocks, 2. Evaluation of the 1958-59 Rabi Crop Campaign in selected areas in Punjab, Rajasthan and Uttar Pradesh, 3. Case Studies—Panchayats and Co-operatives, 4. Some Aspects of Rural Unemployment, (1960).
33. Evaluation of 1958-59 Rabi Crop Campaign in Punjab, Rajasthan and Uttar Pradesh, (1960).
34. Some Successful Panchayats—Case Studies (1960).
35. Some Successful Cooperatives—Case Studies 1960.
36. A Study of the Lok Karya Kshetras of the Bharat Sevak Samaj (1960).
37. Summary of Evaluation Studies (1960-61), (1961).
38. Evaluation of the Gram Sahayak Programme (1961).
39. Study of the Multiplication and Distribution Programme for Improved Seed, (1961).
40. Study of the Problems of Minor Irrigation. (1961).
41. Soil Conservation Programme for Agricultural Land (1962).
42. Case Studies of the Role of Bullock Carts and Trucks in Rural Transport (1963).
43. Problems of extension of Primary Education in rural areas 1965.
44. Current Evaluation of the Applied Nutrition Programme, (1964-65) (1965).
45. Report on Evaluation of the Rural Electrification Programme 1965.
46. Problems of Coordination in Agricultural Programme. 1965.
47. Re-Survey of 18 C.D. Blocks—Notes & Tables (Cyclostyled). 1965.
48. Interim Report on Evaluation of Consumer Cooperatives. (Cyclostyled). 1965.
49. Study of Utilisation of Cooperative loans. 1965.
50. Evaluation of Major Irrigation Projects—Some case studies 1965.
51. B.M.S. of 34 C.D. Blocks—Notes & Tables (Cyclostyled) 1966.
52. Regional Variations in Social Development and Levels of Living—A study of the Impact of Plan Programme Vol. I 1967.
53. Report on Evaluation of Consumer Cooperatives 1967.
54. Evaluation of the working of Lok Karya Kshetras (Under print) 1967.

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